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July 1957

MPM Metal Products Manufacturing

including finish

SERVING THE *Appliance* AND FABRICATED METAL PRODUCTS INDUSTRY

FROM RAW METAL TO FINISHED PRODUCT

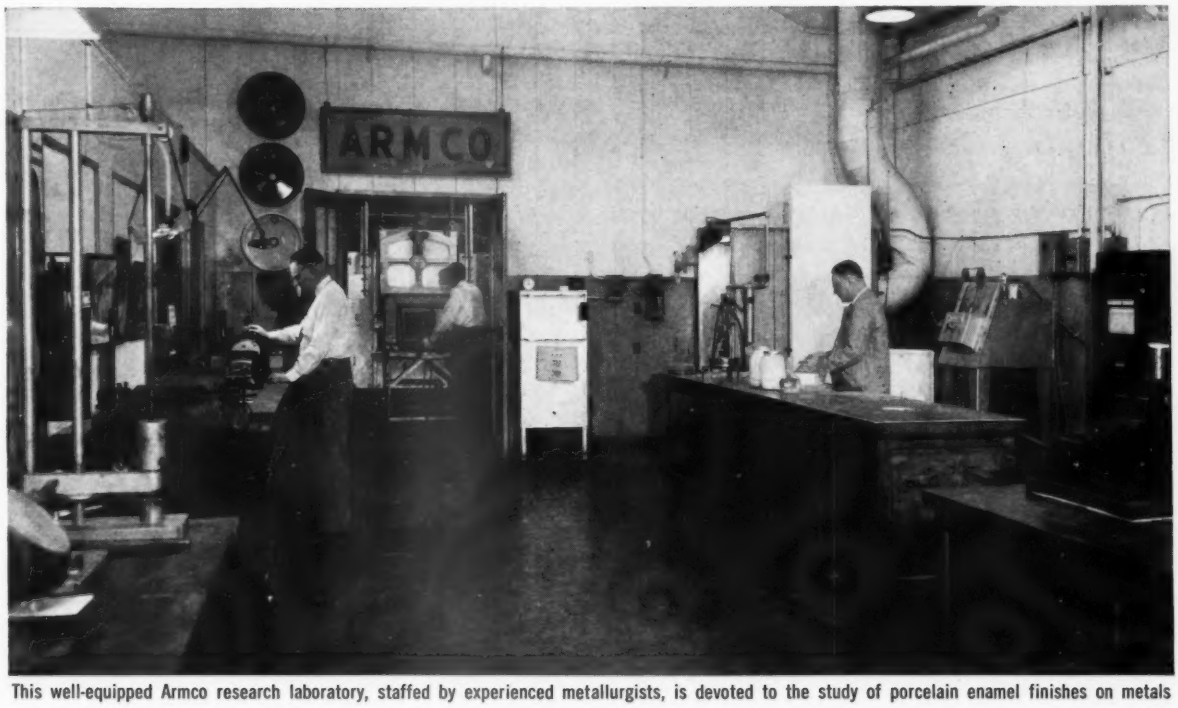
The Lutheran Brotherhood Office Building in Minneapolis is another outstanding example of the architectural potentials of porcelain enamel. In addition to the economies gained by the use of lighter structural members and the saving in installation time, porcelain enamel provides permanently low upkeep and untarnished freshness.

Architects have found in porcelain enamel a material of almost unlimited versatility in effective applications; and manufacturers have found in "Ceramic" a dependable source of supply for precise color matching and uniformity, and for smooth workability.

C-20

CERAMIC COLOR & CHEMICAL MFG. CO.
New Brighton, Pa., U.S.A.

Their Job: To help you get a perfect Porcelain Enamel Finish



This well-equipped Armco research laboratory, staffed by experienced metallurgists, is devoted to the study of porcelain enamel finishes on metals

Perfect porcelain enamel finish makes a persuasive salesman for any appliance. And a high quality enameling base is essential for smooth, flawless finish.

That's why Armco research engineers developed Armco Enameling Iron. And that's why Armco porcelain enameling specialists are always on the job to maintain its quality.

CONSISTENT Results

Here's a base metal for porcelain enameling that offers the uniform properties that mean consistently excellent results. Sheet after sheet, here's what you get with Armco Enameling Iron.

- **firm bond**
- **maximum freedom from gas-forming impurities**
- **great resistance to sag at firing temperatures**
- **surface that assures uniform enamel drainage**

We'll be glad to send you the full story about this special base for highest quality porcelain enameling. Just fill in and mail the coupon for your free copy of the catalog, "Armco Enameling Iron."

ARMCO STEEL CORPORATION
1607 Curtis Street, Middletown, Ohio
Send me a copy of the catalog, "Armco Enameling Iron."

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Firm_____

Street_____

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1607 CURTIS STREET, MIDDLETOWN, OHIO
SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

KS Chef-o-Matic

SURFACE ELEMENT TEMPERATURE CONTROL IS BEST FOR YOU AND YOUR RANGE CUSTOMER

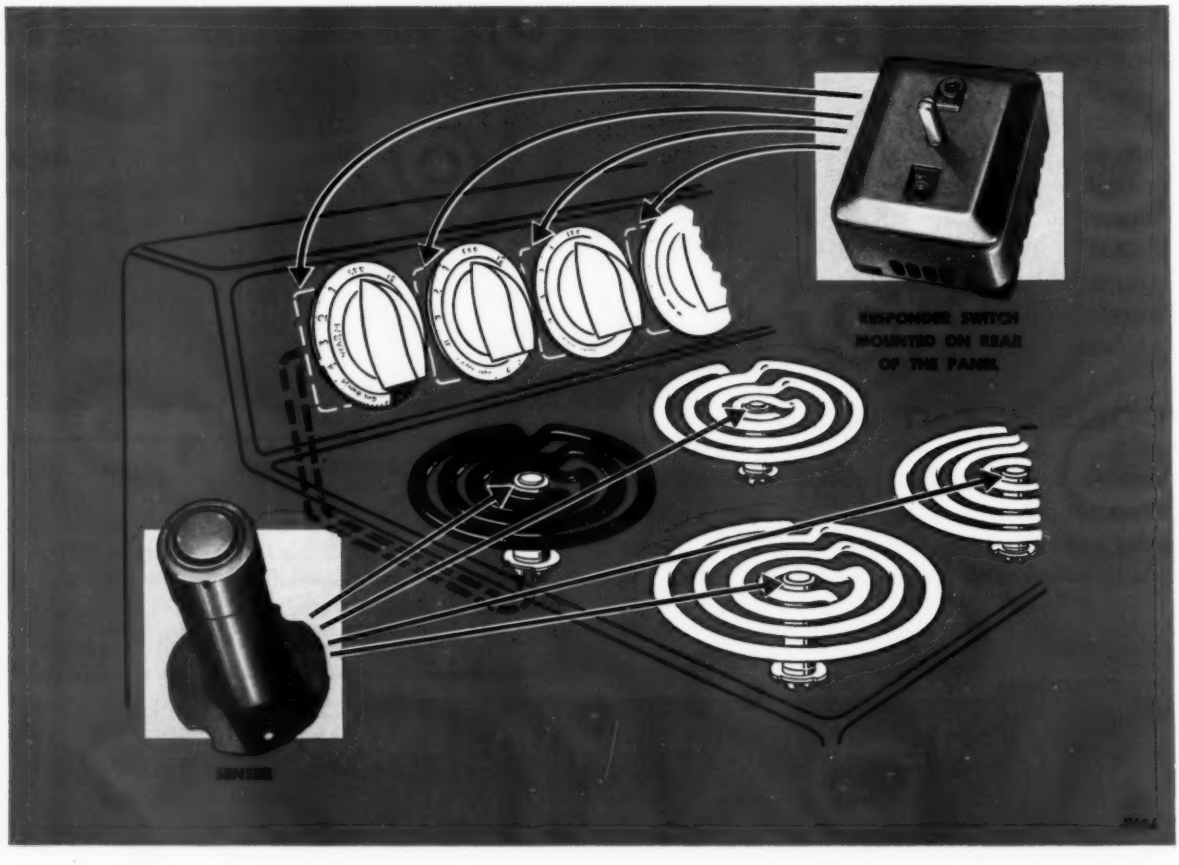
When selecting the automatic surface element control for your electric range, consider these significant features of the King-Seeley system:

- Temperature control range—100°F to 450°F
- Infinite number of precision settings within the temperature range, on a linear scale, in either knob rotation direction
- Quick response and recovery, dependable repeatability
- Anticipating feature of proportioning control limits over-shooting
- Accurate control in the Warm, Boil and Fry ranges
- All electric units with wire connections only—no tubes or other mechanisms to fuss with
- All units completely interchangeable
- Controls any wattage up to 3000 watts
- Expensive dual wattage elements not necessary
- User safety assured by low voltage system between senser and responder switch
- Only one transformer for any number of surface units
- Automatically reduces wattage when cooking utensil is taken off surface element
- Rugged senser—withstands up to 800°F
- Economical and easy to install

MAKE YOUR OWN COMPARISONS OF PERFORMANCE, QUALITY AND COSTS. WRITE FOR COMPLETE SPECIFICATIONS.

KS

KING-SEELEY CORPORATION
ANN ARBOR, MICHIGAN



July • 1957

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MPM

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METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is $8.00 per year, domestic. To all other countries $10.00 per year (U.S. funds). Single copies, $1.00.

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Accepted under the act of June 5, 1934, at Aurora, Illinois authorized January 7, 1948.

SIX-GOAL MAN FAILS TO FLAKE TI-CO®

Captain Pat Conners, six-goal man and captain of one of the Midwest's top polo teams, the Shamrocks, examines unflaked sheet of TI-CO after his repeated drives of a polo ball driven into it at 85 mph.

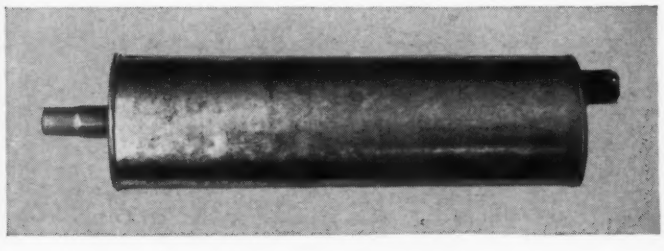
Not many applications require TI-CO's coating to withstand punishment equal to the 85 mph slam of a polo ball. But, you can see how this unusual test does demonstrate the ability of TI-CO to take the toughest fabricating operations . . . stamping, drawing, crimping, lock-seaming, brake forming . . . without cracking or flaking of the zinc coating.

TI-CO's secret is in the patented Sendzimir process which produces a galvanized sheet with a tightly adhering zinc coating that "flows" with the base metal as it is being fabricated. In stamping and other forming operations, non-flaking TI-CO eliminates costly down time and clogging of machines.

Corrosion resistant TI-CO adds saleability to top brand appliances and auto parts

This is the assembly for the inner drum of a popular brand automatic clothes dryer. When the manufacturer started using Inland TI-CO on this application he added the very important sales advantage of corrosion resistance. The tightness of the zinc coating on TI-CO Galvanized Sheets makes possible tough fabricating operations, such as the punching on the basket of this washer drum, without danger of flaking or peeling. Conventional pot galvanized sheets couldn't take it.

Automobile mufflers are subjected to severe corrosive conditions. Rapid temperature changes produce condensation inside the mufflers. Weathering goes on constantly outside. The manufacturer of this muffler gained superior durability and resistance to corrosion and weathering when he started using Inland TI-CO Galvanized Sheets. The life of the finished product was extended and saleability was increased.



This front panel of the cabinet for a leading automatic washer, as well as the complete wrap-around itself, is made from Inland TI-CO Galvanized steel. Why? Because at very little additional cost over ordinary steel the manufacturer added a demonstrable sales feature . . . protection against corrosion. TI-CO takes the sharp draw on the corners of this panel without flaking. The zinc coating stays put . . . maintaining over-all protection.

If you manufacture a product that could profit from this sales feature of built-in resistance to corrosion, even though its forming operations require superior ductility . . . it will pay you to investigate non-flaking Inland TI-CO Galvanized Sheets.

TI-CO galvanized sheets are now more readily available!

The terrific demand for this high quality sheet has kept TI-CO in short supply since its development. Now, additional production facilities have been completed making greater quantities available.

TI-CO is available in cut sheets or coils, in gages 8 to 30 inclusive and widths as great as 60 inches. TI-CO comes with dry, oiled or chemically treated surfaces. Consult your Inland representative for your requirements.

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport St. Louis • Kansas City • Indianapolis • Detroit • New York

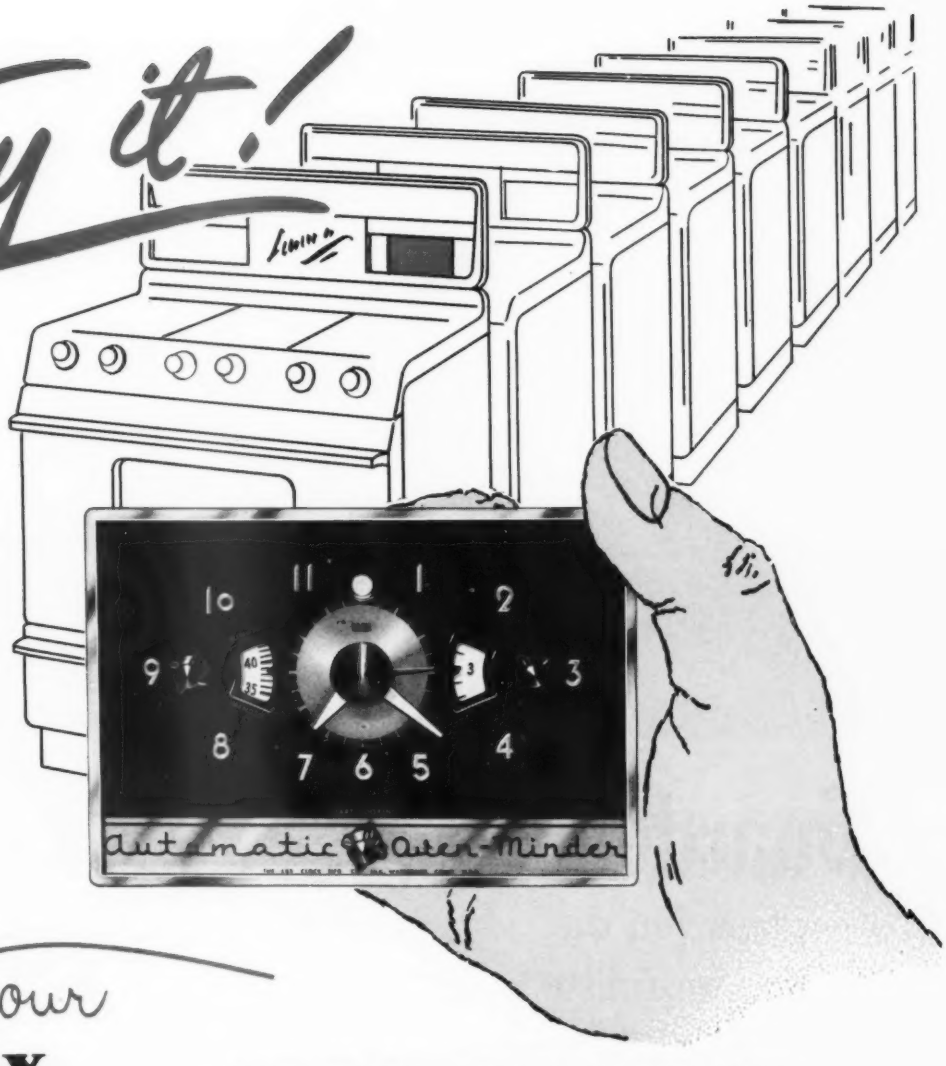
INLAND TI-CO

Look for this brand—
your assurance of
non-flaking performance

THE MPM spotlight

A three-spit "Rotomatic" rotisserie highlights this new 40-inch Roper "Gourmet" gas range. A separate snack broiler adds to the range's versatility, and the three-spit design accommodates large fowl or small pieces of meat. Other features include automatic top burner control, automatic built-in griddle, and new top burners.

Try it!



four **LUX** exclusives!

- **ONE KNOB "AUTOMATIC ON"**
- **ONE KNOB "AUTOMATIC OFF"**
- **MELODIOUS BELL-CHIME SIGNAL**
- **TROUBLE-FREE "LUBE-LESS" TIMER MOTOR**

America's most popular range timer deserves a trial on your line. Add to the sales appeal of your product. Send coupon for complete information.

LUX Time
YOUR TIME REMINDER LINE

THE LUX CLOCK MFG. CO., INC.
WATERBURY 20, CONNECTICUT

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BEAUTY *that sells!*

TOUGHNESS *that lasts!*

Guardsman®

gives you the proven finish combination* for fine appliances.

PERMAGARD PRIMER

Epoxy primer for flocoat, dip or spray. Flowing, flexibility, stability and adhesion characteristics are excellent High resistance to detergents, humidity and salt spray.

PERMAGLO ENAMEL

High gloss Alkyd-Amino finish available in white and custom colors. Manual, automatic or electrostatic spray application. Excellent hiding and color retention. High degree of hardness and highly resistant to detergents, humidity and salt spray.

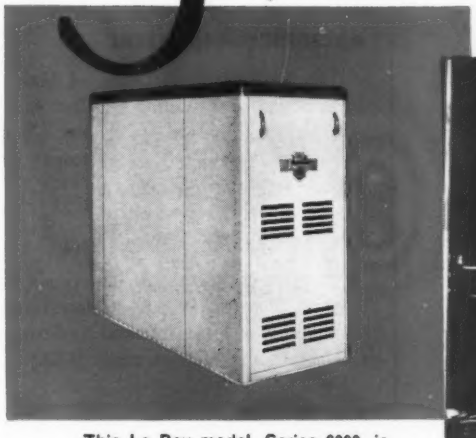
GRAND RAPIDS VARNISH CORPORATION

Grand Rapids, Michigan

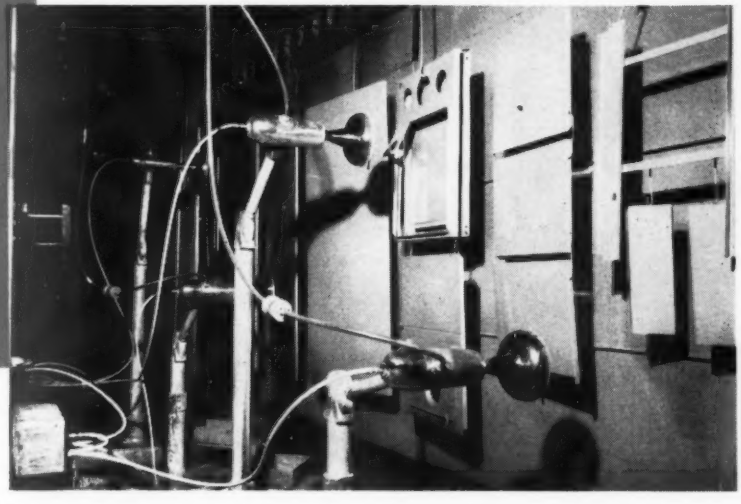
Makers of the Famous ®Guardsman *Finish and* ®Guardsman *Cleaning Polish*

*THE BETTER THE FINISH THE BETTER THE BUY

3 times as many Furnace Casings per gallon of paint with RANSBURG NO. 2 PROCESS!



This Lo Boy model, Series 6000, is typical of the Waterman-Waterbury line of winter air conditioners now painted electrostatically.



Quality of work is improved; Labor costs are cut and Production Stepped up 150% with

RANSBURG Electrostatic Spray Painting

Results exceeded expectations when Waterman-Waterbury, Minneapolis, modernized their finishing department and went from hand spray to Ransburg No. 2 Process in painting their quality line of heating and air conditioning equipment.

By the former hand spray method, W-W used a half gallon of paint to coat a single casing. Now, with Ransburg No. 2, they get SIX CASINGS PER GALLON . . . or 3 times as many per gallon. Furnace casings, as well as other painted parts which go into the famous Waterbury Furnaces, now get a uniform coating of .8-mil.

Production was increased, too, as automatic painting enabled them to step up the conveyor speed from 7 fpm to 11½ fpm. Where they formerly turned out a complete furnace in five minutes, NOW they assemble three in just six minutes . . . an increase of 150%. All in all, they figure the modernization program—with Electro-Coating—saved over $11,000 in the first three months of operation.

NO REASON WHY YOU CAN'T DO IT TOO!

Whatever you paint, we'd like to tell you more about the efficiencies and worthwhile savings which can be yours with Ransburg Electro-Coating Processes. Get our No. 2 Process brochure which cites many on-the-job examples of electrostatic spray painting on a wide variety of products. Or, we'll be happy to loan you our new film, "The Big Attraction" which tells the electrostatic spray painting story in sound and full color. Call or write

RANSBURG
Electro-Coating Corp.
Barth and Sanders, Indianapolis 7, Indiana

Blueprint of Chicagoland Economic Opportunities

What industrial plant sites are available in Chicago and Chicago Heights? Where are they located in respect to transportation, shipping and other facilities? What materials are plentiful? What is the labor situation? What about housing —and schools?

This new book, "Chicago & Chicago Heights Industrial Economic Blueprint," has been published to answer these questions and many more. With maps, diagrams, charts, photographs and text, it gives you a detailed analysis of the area and its physical characteristics. Here are easy-to-grasp facts about population, labor force, raw materials, transportation, utility and business services. The significant figures covering some eighty-service classifications of manufacturing industries are tabulated for quick reference.

"The amount of detail work that went into the preparation of these reports is truly amazing. In all the years in which we have been engaged in plant location work we have never seen so much data collected on a particular area."—from a letter describing previous economic studies by Chicago & Eastern Illinois Railroad.

Available without charge. For a complimentary copy of "Chicago & Chicago Heights Industrial Economic Blueprint," write Mr. H. Sampson, Vice-President, Chicago & Eastern Illinois Railroad, 332 South Michigan Avenue, Chicago 4, Illinois.

C&EI

Chicago & Eastern Illinois Railroad

INDUSTRY MEETINGS

HOUSEWARES

National Housewares Mfrs. Assn., National Housewares Exhibit, Atlantic City Auditorium, Atlantic City, N. J., July 8-12.

ARCHITECTURAL METAL

The National Association of Architectural Metal Manufacturers First Annual Architectural Metal Institute, Northwestern University (downtown campus), Chicago, July 14-20.

INSTRUMENT-AUTOMATION

Instrument Society of America's 12th Annual Instrument-Automation Conference and Exhibit, Cleveland Auditorium, Cleveland, Ohio. September 9-13.

ELECTRONICS

National Electronics Conference, Illinois Institute of Technology, Hotel Sherman, Chicago, October 7-9.

INDUSTRIAL HYDRAULICS

National Conference on Industrial Hydraulics, Armour Research Foundation & Illinois Institute of Technology, Hotel Sherman, Chicago, October 17-18.

PACKAGE DESIGN COUNCIL

Packaging Assn. of Canada Package Design Council and Technical Institute Seminars, Building Centre, Toronto, Ontario, Canada, October 22.

COMPUTER APPLICATIONS

Computer Applications Symposium, Armour Research Foundation, Hotel Sherman, Chicago, October 23-24.

PACKAGING FORUM

Nineteenth Annual Forum of Packaging Institute, Hotel Statler, New York City, October 28-30.

PAINT & VARNISH PRODUCTION

Thirty-fifth Annual Meeting of the Federation of Paint and Varnish Production Clubs, Bellevue-Stratford hotel, Philadelphia, Pa., November 1-2.

PACKAGING EXPOSITION

Canadian National Packaging Exposition, Automotive Bldg., Toronto, Ontario, Canada, November 5-7.

Colors...

that really match!

Plumbing fixtures produced by different ceramic processes *can* be color-matched perfectly with Ferro colors. Experienced technicians working in the industry's most modern and completely equipped color laboratory now take all the "guesswork" out of color problems. Why not put them to work for *you?*

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Color Division

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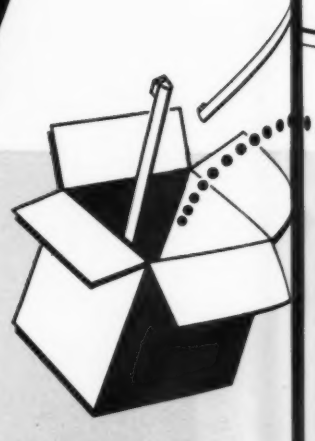
5309 S. District Blvd., Los Angeles 22, Calif.
CANADA: Ferro (Canada) Ltd., Oakville, Ont.

CHECK FERRO FIRST for Porcelain Enamel Engineering, Equipment and Furnaces, Frits and Colors, Mill Additions and Supplies!

Announcing!

Plastic Spacer A
as a Thermo-Br



7 Standard Models Available to You

In the new Mills line you have a selection of distinctive designs available immediately at standard production prices.

7 STANDARD MODELS—4 STANDARD PATTERNS

a new **MILLS PRODUCTS** *service...*

PERMA-GRIP Handles

* Mills Products, Incorporated, manufacturer of the now universally accepted PERMA-VIEW oven door window, used by the leading manufacturers of gas and electric ranges, announces a new service for appliance manufacturers—PERMA-GRIP handles.

You can now purchase your appliance handles built to Mills' quality standards. Seven standard models are offered and four standard patterns are available on any model handle. All handles have plastic spacers which serve as a thermo-break. If you wish, consult with our engineering department regarding special custom requirements.

We have the skilled personnel, the specialized equipment, and we use the right materials to assure a reliable source for quality PERMA-GRIP handles. Let our specialized production lines serve as a part of your sub-assembly facilities. Phone or write us for complete details on PERMA-GRIP handles.

out of our carton—onto your door!

THE WINDOW YOU CAN SEE THROUGH ALWAYS

MILLS PRODUCTS INCORPORATED

1015 WEST MAPLE ROAD • WALLED LAKE, MICHIGAN

ROSS

Air Systems

ENGINEERED ATMOSPHERES
FOR BETTER PROCESSING

BAKING OVENS

Coordinated Production Line... Single Responsibility

There's a vast difference in both results and cost between finishing painted metal surfaces, for example, in an heterogeneous assortment of unrelated processing units and finishing such surfaces in an engineered production line system, all under a single design and manufacturing responsibility.

The latter is the Ross way. While each step in the process from phosphatizing to the final bake presents its own individual problems, the answers to these problems are so worked out as to produce the best possible finish at the lowest possible unit cost.

Ross Engineers would bring to your baking problem the experience gained by close to 40 years service to industry in the important field of baking painted metal surfaces.

THE ROSS GROUP OF COMPLEMENTING SERVICES

J. O. Ross Engineering Corporation, New York
Andrews and Goodrich Division, Boston
Ross Engineering of Canada Limited, Montreal
Ross Midwest Fulton Corporation, Dayton
Carrier-Ross Engineering Company, Ltd., England
John Waldron Corporation, New Brunswick, N. J.

J. O. ROSS ENGINEERING CORP.

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ATLANTA • BOSTON • CHICAGO • DETROIT • LOS ANGELES • SEATTLE

ROSS SERVICES *include the Design and Manufacture of such units as*
BAKING OVENS • INDUSTRIAL DRYERS • METAL DECORATIVE OVENS
CORE OVENS • SPECIAL DRYING • VENTILATING SYSTEMS

Extensive Laboratories and Pilot Plant Facilities for Study of Problems and for Testing Purposes

from the Editor's Mail

embarassing number of inquiries

Attention: Editor Industrial Literature
Dear Sir:
In the May issue of METAL PRODUCTS MANUFACTURING there appeared a notice on page 80 that a booklet is being offered by our client, Wagner Brothers, Inc., on the chemical processing of copper, brass, cadmium and zinc. *Wagner Brothers have no such booklet and are embarassed by the numbers of inquiries which have resulted.*

It is possible that the paragraph was intended to refer to Product Information Bulletin 70.2 on the Iso-Brite copper process and Bulletins 80.2, 80.3, 80.4, 80.5, 80.6, 80.7, 80.8 and 80.9 which cover the line of Benchmark Cleaners which were mentioned in our publicity release some months ago on the new Wagner Chemical Line.

We would appreciate your publishing a clarification of your literature note to the effect that separate technical bulletins are available on the processes and cleaners mentioned. No general booklet of interest to the layman is available.

F. P. Bingham
Bingham Technical Advertising
Detroit, Michigan

Ed. Note: The MPM industrial literature editor keeps evidence on all items listed. In this instance the original information has disappeared into thin air. We sincerely hope that the explanation in Mr. Bingham's letter will clarify the error for MPM readers.

interested in plastisols

Gentlemen: We have found your articles on plastisols in your March and April issues most interesting. These articles will be found on page 46 of your March issue and page 50 of your April issue.

I have need for six additional copies of each of the two issues, which I would be willing to purchase, or perhaps you have reprints available in a minimum quantity.

D. C. Powell
Advertising Production Supvr.
Dishwasher & Disposall Dept.
General Electric Co., Appliance Park
Louisville 1, Kentucky

Ed. Note: We are pleased to learn of your interest and are sending the twelve issues of METAL PRODUCTS MANUFACTURING to you.

would miss MPM

Gentlemen: "Will you please change the name of Mr. Paul A. Hunker, The Brunner Co., Gainesville, Georgia, on your mailing list to read as follows:

Mr. Paul A. Hunker
Dunham-Bush, Inc.
West Hartford 10, Conn.

Your early attention to this will be appreciated as he does not wish to miss a single issue of METAL PRODUCTS MANUFACTURING.

Belle M. White
The Brunner Co.
Gainesville, Ga.

visitor wants information

Gentlemen: "Am interested in getting in touch with the chemical supply house who can furnish the concentrates for milling with chemicals as described on page 46, June issue.

K. F. Wilkinson
Mills Novelty Co. Ltd.
Manchester, England

Ed. Note: Turco Products, Inc.
Los Angeles, Calif.

correction for "strippers"

Gentlemen: "I have received the June issue of MPM and have read the article on "Paint Removing Compounds." All in all, it is very well set up . . . . there is one flaw in the copy . . . .

On page 43, in the second column, it is stated that the strippers are divided into three particular groups. This should read: *1) Hot Caustic Type; 2) Cold Solvent Type; and 3) Flush-Off Type.* Unfortunately, the article reads '1) Water Soluble Caustic Type; 2) Hot Caustic Type;' this is actually saying the same thing twice. The hot caustic type is, of course, water soluble, therefore, the two categories shown are synonymous, whereas the cold solvent type is left out entirely."

B. L. Smalley
President
L. R. Kerns Co.
2657 E. 95th St.
Chicago 17, Illinois

Ed. Note: The original edited manuscript was correct. Unfortunately the change in copy, someplace along the makeup line, was missed in final proofing. Most of MPM's readers would, we believe, recognize the error in the article.

likes photo coverage

Gentlemen: Just a note to tell you how impressed we were with your photo coverage of our Annual Meeting held at French Lick in April. You must have spent a busy two days in photographing such a wide array of our members. It is certainly a representative cross section of the entire home laundry appliance industry.

B. J. Hank
President
American Home Laundry Manufacturers Association

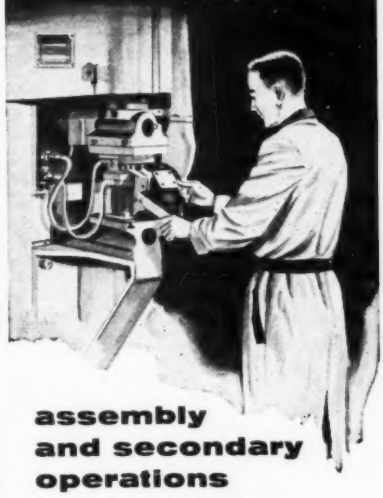
Ed. Note: We consider photographic coverage a very important part of our editorial work from the standpoint of reader interest. This comment is greatly appreciated.

finds Bund talk interesting

Gentlemen: I have read with interest your article on the ARI Fourth Annual Meeting in the June issue of METAL

to Page 25 →

if you buy **stampings** ...look for the PLUS **beyond** the PRICE!...



assembly and secondary operations for instance

When your stamped parts need to be welded, drilled, tapped, riveted or assembled . . . we are equipped to do it.

Many of our customers use this extra service to help meet production deadlines, to streamline their manufacturing and to place responsibility under one roof.

Remember this *plus-beyond-the-price* the next time you buy stamping components . . . and let us see your prints!

A brochure is yours for the asking!

DE-STA-CO

DETROIT STAMPING COMPANY

Established 1915

404 Midland Ave., Detroit 3, Mich.

"America's Leading Job Stamping Manufacturer"

Look to Detroit!

. . . and remember, STAMPING is our middle name

NORTHWEST
LEADS THE WAY WITH CHEMICALS FOR USE WITH
ALUMINUM

If you work with aluminum you'll be interested in Northwest's outstanding line of chemicals for use with modern alloys. Northwest's continuing research and development program has earned them the reputation of "First with the best" in this rapidly developing field. It will pay you to investigate:

- **ALKALUME CLEANERS—**
  A full line of cleaners and etching compounds especially formulated for use on aluminum alloys prior to plating, anodizing, painting or welding.
- **ALKALUME PRE-PLATE—**
  An especially effective zincate bath for preparing aluminum for plating.
- **ACID SOLVENT EMULSION CLEANER No. 1—**
  An effective cleaner for fabricated aluminum parts before finishing.
- **DRAWING AND STAMPING COMPOUNDS FOR ALUMINUM—**

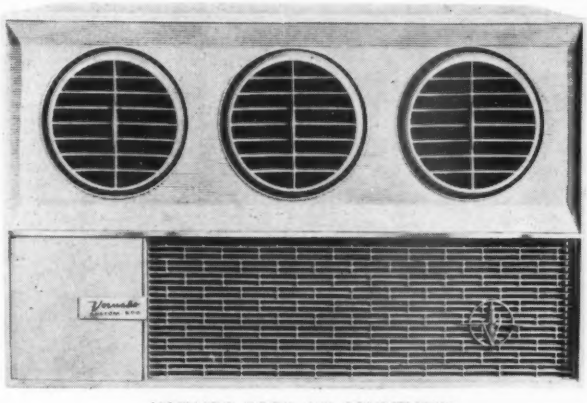
Write for detailed literature.

REMEMBER!

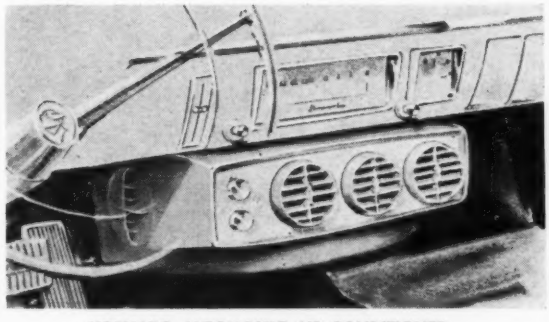
"Your cost per finished article is the true cost of your cleaner."

NORTHWEST CHEMICAL CO.
9310 ROSELAWN DETROIT 4, MICH.

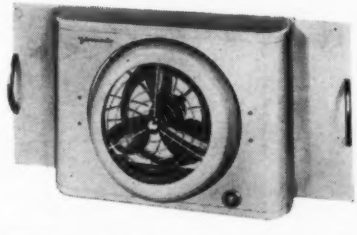
it takes a lot of careful planning to maintain uninterrupted production of *Vornado*® room and automobile air conditioners and air circulators



VORNADO ROOM AIR CONDITIONER
Model Custom "200"



VORNADO AUTOMOBILE AIR CONDITIONER



VORNADO TURNABOUT WINDOW FAN
Model 30T

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UNIVERSAL SCREWS

Keeping production lines operating smoothly and efficiently is an exacting job that requires careful, intelligent planning and purchasing. We're pleased that The O. A. Sutton Corporation, like other leading manufacturers of home appliances, uses Universal Screws in their assembly operations . . . pleased that Universal quality, dependability and low costs have become an accepted fact in the home appliance field. If you have not yet experienced the plus factors that buying screws from Universal provides, there's no better time than now to take advantage of them . . . to put Universal know-how and service to work for you.

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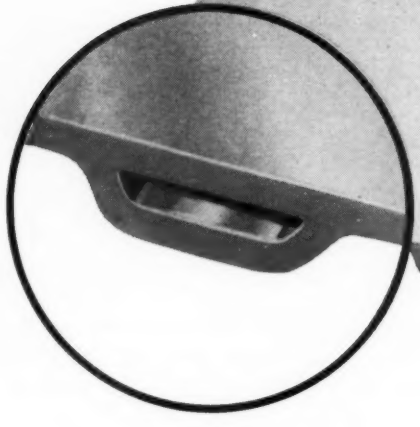

BETTER PERFORMANCE — MORE CONSUMER SELLING FEATURES

- Flat surfaces in evaporators permit direct contact with food packages, ice cube trays and other items providing heat transfer by conduction and completely eliminating any insulating air spaces. This aid to faster freezing also means a bigger consumer selling point for refrigerator and freezer manufacturers.
- Flat surfaces make it easier to defrost . . . improve drainage of water and other liquids . . . permit faster, easier, more thorough cleaning. More sales features!
- Flat surfaces permit small jars, bottles, cans and other containers to rest on smooth surface without wobbling or tipping, thus reducing possibility of spillage . . . still another good sales point.
- Flat surfaces mean no high points to concentrate wear on critical tube surfaces.
- Tubing right in the sheet routes refrigerant exactly where needed —no loss in conductivity. Tubed Sheet *One-Side-Flat* (two sheets of aluminum metallurgically bonded together so that the heat transfer passageways are in the sheet) is flat on one side and has the built-in tubing pattern on the other side.

NEW FLEXIBILITY OF DESIGN

- Reynolds new Tubed Sheet *One-Side-Flat* is the only sheet with one flat side providing integral tubing in any parallel or non-parallel patterns no matter how complex!
- Almost any tubing pattern that can be drawn on paper can be quickly and economically produced on Tubed Sheet with practically unlimited circuiting possibilities.
- Passageways can be flat or oval; large or small; spaced close together or apart.
- Redesigns are simplified, can be made quicker.

GREATER ECONOMY

- Eliminates metal used for evaporator tubing, accumulators and receivers.
- Many connecting and assembly operations are eliminated.
- Additional tubing lengths add nothing to cost.
- Redesigning costs are much less.

MORE ATTRACTIVE PRODUCT

- Can be embossed in a decorative pattern or left smooth.
- Can be color anodized in any color desired to match color-styled refrigerator and freezer interiors.

refrigeration industry...

ALUMINUM TUBED SHEET One-Side-Flat

(Patent Pending)

Tubed Sheet *One-Side-Flat* refrigerator evaporator
Note pattern on one side, other side smooth.

For full details on Reynolds Aluminum Tubed Sheet *One-Side-Flat*, contact your nearest Reynolds Office or write *Reynolds Aluminum Fabricating Service, 2053 South Ninth Street Louisville 1, Kentucky.*

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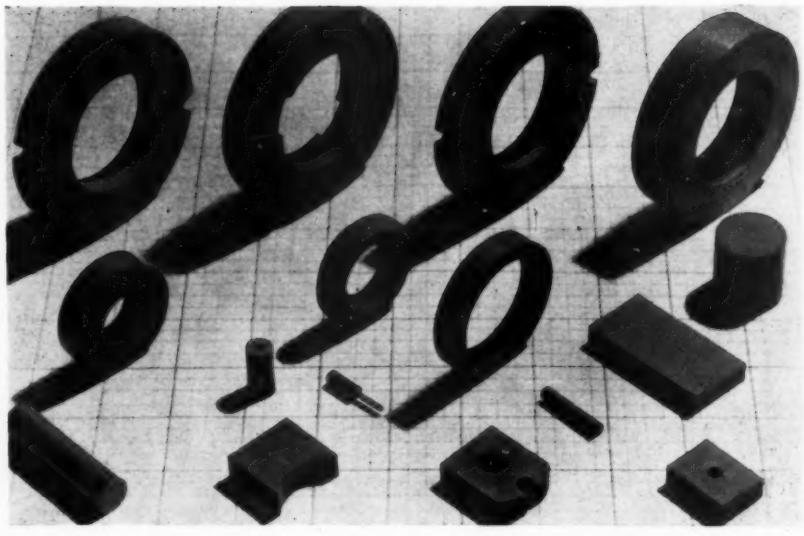
The answer's yes . . . IF!

Formerly, we could cure one out of every 4 cancer patients. Today, it's one out of 3. So . . . why the big IF? Because the odds against cancer depend on you! Only *you* can keep alert for any of the 7 danger signals, and see your doctor about even the tiniest "maybe." Only *you* can give us the money we need to keep research going full speed. Remember, time is *everything* with cancer. So don't wait! See your doctor for a health checkup. And send a check to the American Cancer Society–today! Send your gift to "Cancer" in care of your local Post Office.

American Cancer Society



Low cost ceramic magnets are highly permanent

A LOW COST, ceramic permanent magnet material has been developed that combines adequate energy product with high coercive force, low residual induction, virtually 100% electrical resistivity and exceptional resistance to demagnetization. These unique characteristics, plus low cost and the non-critical nature of the ceramic, make magnets of this material well fitted for all ordinary permanent magnet uses as well as others of a more exacting nature, such as those where the magnets may be exposed to strong demagnetizing fields.

Known as Stackpole Ceramagnet permanent magnets, the new units retain their energy even when used without "keepers" or under other closed-circuit conditions, and in the presence of strong opposing fields. As an example, Ceramagnet cannot be demagnitized by another magnet of up to 2,000 gauss.

Ceramagnet magnets are practically non-conductors. Electrical resistivity is 6×10^{10} ohms/cm @ 25°C., making them ideally suited for high-frequency and high-voltage circuits. They can be placed in the direct path of electromagnetic energy to rotate the polarization plane, to focus cathode ray tube beams or for similar purposes.

Their magnetism will be unaffected by their surroundings. They themselves will exert little or no proximity effect on nearby circuitry.

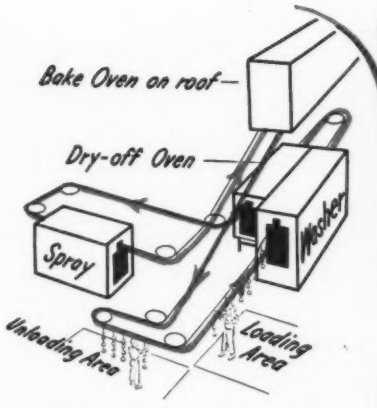
Another feature that may offer interesting possibilities is the fact that Ceramagnet temperature characteristics are linear, including retrace, to 400°C. Made of non-critical, inexpensive barium and iron oxides, the new Stackpole permanent magnets are classified among the hard magnetic materials. They cost materially less than metallic magnets. Also, they weigh less — only 4.85 gms/cm^3.

Although the Ceramagnet energy product (0.915×10^6 gauss-oersteds @ 600 gauss working point) is less than that of conventional metallic permanent magnets, the important point is that their full energy is available under practically any condition. Moreover, the fact that they can be magnetized either before or after assembly recommends their use in many instances . . . especially where it is impractical to magnetize the units after they have been assembled in their holding fixtures.

Units are available in practically any size or shape. They are machineable by wet grinding and may be machined *after* magnetizing. Although they can be magnetized in any direction, highest energy product is obtained by magnetizing across thinner sections.

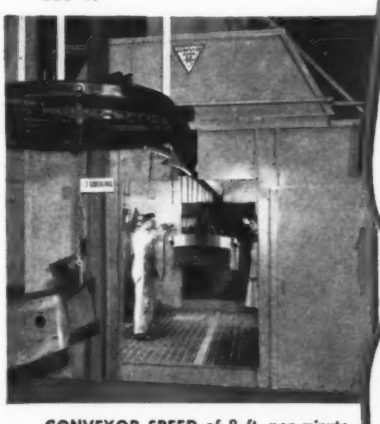
Complete engineering data on Ceramagnet permanent magnets, including graphs of properties, are available.

Write the SPECIAL FEATURES EDITOR of MPM



FLOW DIAGRAM shows perspective (not actual scale) of new metal processing and paint finishing system in Tennant's new plant. Conveyor is 500 ft. long. The 74 ft. bake oven is built on the plant's roof to save floor space. Just-sprayed parts travel up and into the oven through its underside opening. Baking lasts eight minutes at 330° F.

ALL PARTS first enter 3-stage 44 ft. washer at right, then return through 34 ft. dry-off oven at left. Note master control panel alongside dry-off oven. In washer, surface of metal parts is converted to iron-phosphate coating to prevent rust and corrosion. Temperature of dry-off oven is varied from 350 to 400° F., depending on size of parts.



CONVEYOR SPEED of 8 ft. per minute gives sprayers time to handle basket loads of small parts or large frames such as shown in photo. After prime coat is sprayed and baked on, parts go through system again (washer is temporarily shut off) for spraying and baking of the finish coat.

New 2-Tone Tennant Model "80" Sweeper

74 DIFFERENT PARTS, each twice sprayed and baked, are in this new Tennant Model "80" power sweeper for industrial use. The "80" goes anywhere, gobbling up dirt, debris, dust and litter. It features optimum design for most plants; will clean 19 out of 20 plant aisles in not more than two passes!

From 80 man-hours to 24...

FASTER, BRIGHTER PAINTING OF 1000 DIFFERENT PARTS!

The G. H. Tennant Company, Minneapolis, used to have trouble painting production quantities of 1000 different metal parts for their power sweepers, floor machines, scarifiers, roof scrapers and concrete routers.

This new DESPATCH continuous-conveyor finishing system speeds washing and drying of *all* parts (they weigh from ounces to 800 pounds) and speeds spraying and baking of the prime coat and the bright orange or cream finish coat.

The system enables Tennant to do in 24 man-hours what used to take 80 man-hours, and assures a superior finish.

The entire system was engineered, built and installed by DESPATCH in cooperation with the Tennant Company. DESPATCH can help you. There's a DESPATCH-trained resident engineer near you. Why not talk to him about your finishing requirements?

Write today for Bulletin 51

16 colorful pages on modern ways to achieve better finishes, faster production and smoother handling of metal products . . . at lower cost.

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PIONEERS IN ENGINEERING FINISHING SYSTEMS FOR INDUSTRY

Twin SoftServer and ShakeMaker machines, engineered for use with conventional counters.

1. *Last Step in final assembly . . .* → *. . .*

Engineering "SoftServe" and "ShakeMaker"

how design engineers at Sweden Freezer, Seattle, Washington pooled their efforts with components engineers to simplify design, decrease space requirements, reduce unit weight and cut manufacturing cost

SWEDEN Freezer Manufacturing Company, Seattle, Washington, is a volume producer of soft serve and milk shake dispensing machines . . . with dealers and sellers throughout the United States, Canada, and in 42 foreign countries. To all intents and purposes the "SoftServe" and "ShakeMaker" are identical, except for the larger motors needed for making the soft ice cream . . . thus the "break down" of the product design and the operating characteristics of the two machines are very similar.

Design requirements outline

Design engineering began about four years ago on a low cost, high production milk shake machine. Engineering was asked to develop a milk shake machine that was a counter model not more than 18 inches high, 29½ inches wide and 16 inches deep, with a production capacity of a much larger machine. It was to be quiet in operation and so simple to operate that any inexperienced person could operate it.

Working toward a machine that would fit into a minimum backbar space of limited height, width and depth, Sweden's designers and engineers came up with the prototype of the model 211, the ShakeMaker. The 211 had just been launched as an engineering project when its companion, the 212 SoftServe went into the research mill. As the 211 and 212 models began to take shape on drafting boards and in actual operating models, there loomed the vision of incorporating the small dimensions of the counter models into floor models, and the models 207, and 215 ShakeMakers and 208 and 216 SoftServe were under way.

As these floor models were engineered, along with them came the development of a joining kit, so that the individual machines could be put together to give several combinations of production or "flavors" plus floor dimensions that would fit a variety of installations.

Two machines fastened by a standard joining kit, eliminated one set of legs and inner panels with subsequent savings in cost and shipping weight.

In addition, provision was made for adding accessories in the way of portion controls, foot switches and in the 215 and 216 models using air cooling instead of water cooling.

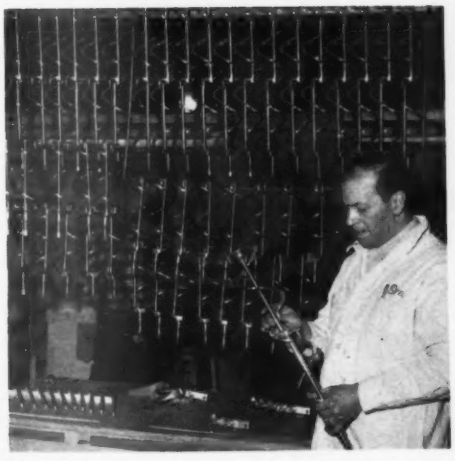
Design engineering for size and weight reduction

Major importance was put on size and weight. Shipping weight, for instance, in an old, large model was 1,050 pounds. Shipping weight for the equivalent reengineered model is 565 pounds. The dimensions of that old model were: 32 inches deep, 22 inches wide, 58 inches high. The new: 30 inches deep, 14¾ inches wide, 52 inches high. (Other model weight and size reductions proportionate.)

The two inch depth reduction allowed the machines to be matched with the 30 inch counter depth, the radically "slenderized" units made possible the joining of matched pairs of machines in 30 inch width space, and the half-foot in height reduction provided ease of loading soft ice cream or milk shake mix into the top of the machine. (Di-

to Page 25 →

. . . 2. *four major sub-assemblies. Man's right hand is on upper structure sub-assembly (front and top, with freezer cylinder, heat exchanger, and dehydrator enclosed in plastic insulation); his left hand on cross sub-assembly which, when bolted to back,*



3. *will tie assemblies into rigid unit. Back sub-assembly (with refrigeration coils in place) has already been bolted to bottom sub-assembly (compressor on inverted pan). Motor will be installed on cross members.* **Photo 2** *. . . Robert C. Ridgway, Supervisor of Engineering, checks over assembled and tested SoftServer.* **Photo 3** *. . . Dashers are engineered so*

4. *that a single unit can be used, or two combined for a longer model.* **Photo 4** *. . . Model removes dasher from cylinder of SoftServer. Note twin Machines, with ShakeMaker at her right. No center legs are required for twin unit.*

ASSEMBLY OF COMPONENTS

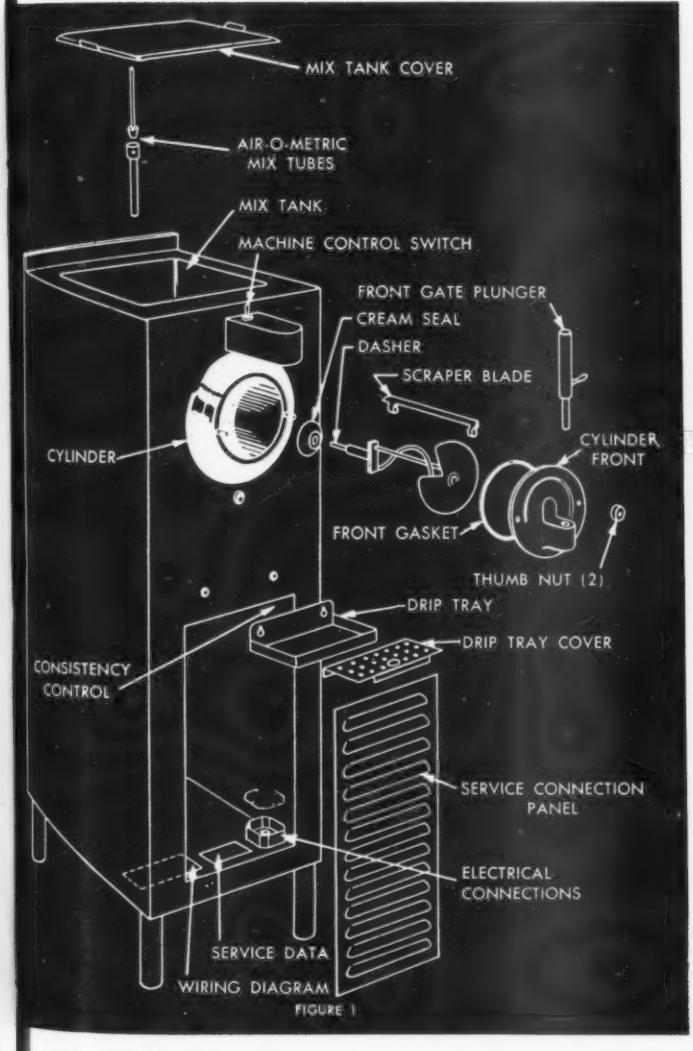
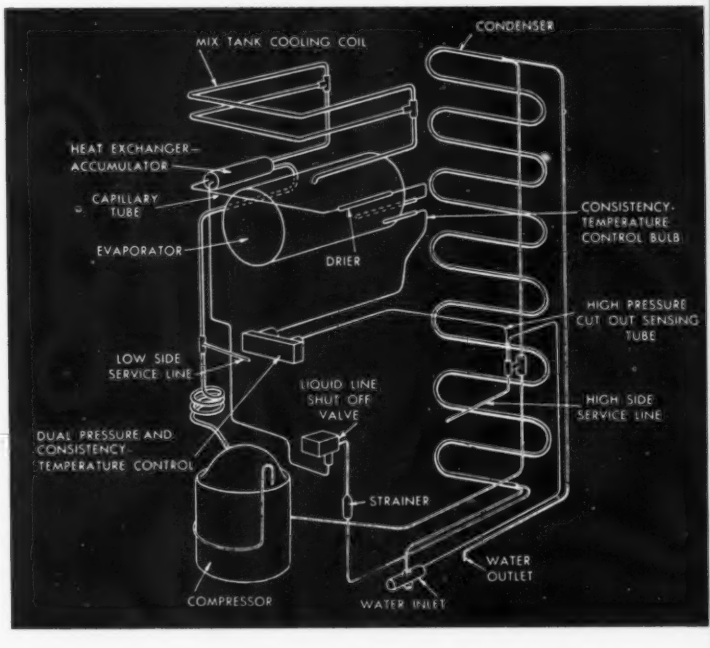


FIGURE 1

REFRIGERATION SYSTEM



Starting with the compressor, the refrigerant is discharged into a water-cooled condenser through a shock coil. The course of the refrigerant then continues out of the condenser, through a strainer, and then through a solenoid liquid line shut-off valve. This valve is closed when no motors are operating. The valve opens when either the dasher motor or the compressor motor operates. The refrigerant, after passing through the liquid line shut-off valve, then continues into the capillary tube (part of which is coiled inside of the heat exchanger).

The refrigerant enters a dryer as it leaves the capillary tube and then flows into the evaporator. From the evaporator, refrigerant is conducted through mix tank cooling coils and then into the heat-exchanger-accumulator. The cycle is completed as the refrigerant comes out of the heat-exchanger-accumulator, through the suction line vibration-damping coil and back into the compressor.

"NOW, AFTER 9 YEARS . . .

I'm using more Hudees than ever!

Robt. J. Erickson, Vice President
C. J. Erickson Plumbing Co.
Chicago, Illinois

One of the midwest's largest pumbing contractors and kitchen modernizers, the C. J. Erickson Plumbing Co. has been using Hudee Sink Frames for more than 9 years. In addition to the new retail showrooms pictured above the company maintains a large office, shop and warehouse.

Mr. Erickson says: "As our business has grown we have used more Hudee Sink Frames each year and are now using more than ever. You've got to have confidence in a company that's always first to introduce new ideas and improvements in a product."

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National consumer and trade magazines tell the story of Hudee superiority

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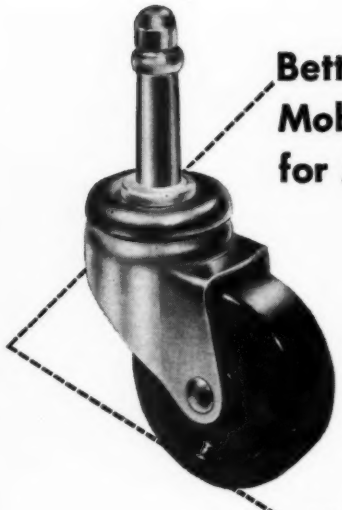

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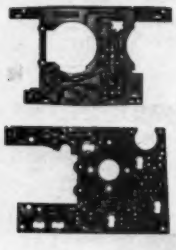
Applications Possessing High Density of Wire and Component Connections may Benefit by Utilization of PRINTED CIRCUIT PANELS



The printed circuit technique offers possibilities for advanced product design and manufacture through:

- *Mechanized assemblies*
- *Uniform lead dress*
- *Unit replacement*
- *Multiple soldering*
- *Simplification and integration of components*

FOR FULL INFORMATION ON HOW TO DESIGN FOR PRINTED CIRCUIT PANELS, WRITE ON COMPANY LETTERHEAD FOR THE SECOND EDITION OF THE HANDBOOK "UTILIZATION OF PREFABRICATED WIRING"

METHODE Manufacturing Corp.

2021 West Churchill Street • Chicago 47, Illinois

"SOFTSERVE" AND "SHAKEMAKER"

Continued

Model at SoftServer and ShakeMaker modular-constructed machines. They are similar, but SoftServer has heavier motor.

mensions of table models are similarly engineered.)

Engineering for fewer parts and simplified operation

Performance engineering provided for a minimum of adjustments, reducing the possibility of operator error. Formerly machines were operated by foot switch, now when the lift gate is lifted the machine automatically starts. There is only one machine control switch for continuous run, off, or for wash dasher when cleaning.

Sanitation-engineering ties in here. The number of component parts was minimized and they were all designed for ease of cleaning. Old machines had 14 parts that needed to be removed for cleaning. The number was reduced to seven for the SoftServe and eight for ShakeMaker.

Related to this is over-all "serviceability". All field service can be handled by removing the service connection front louvered panel . . . important because floor models are generally sandwiched in between counters. Also, electrical connections can be made through the bottom of a machine as it stands between counters.

Structurally the machines are now made like household appliances. Formerly the main frame was welded of angle iron upon which the exterior independent paneling was placed. This has been replaced almost entirely by formed sheet metal construction.

Two other structural details are noteworthy. Formerly, the mix tank was a set-in pan, now it is part of the upper structure itself, silver soldered in place, adding strength and making for a more sanitary machine. A second detail is the couplings for the adjustable legs which also act as corner reinforcing elements.

Components play part in mechanical simplicity

Mechanical simplicity is engineered throughout the machines. This was only possible when the work the engineers had been doing with component suppliers began to bear fruit and compressors, electrical motors and other parts suited to Sweden's needs became available. Developments in the company's own lab and those taking place in air conditioning and refrigeration fields made possible the new-engineered ShakeMaker and SoftServe machines. Sweden was quick to take advantage of new developments.

Some redesign of standard parts should be mentioned. The deep draw stainless steel cylinders, formerly designed with two diameters, are now produced in two lengths of a single diameter. The stainless steel dashers were re-designed for standardization and added strength. (Dasher ends, freezer fronts and other components were standardized for size, making for simplicity in processing, simplified storage, and lower cost.)

A side-note to fabrication is that when the freezer cylinder with heat exchanger and dehydrator is installed the whole is insulated with "foam-in-place" plastic insulation . . . an item which helped make the redesigned machines possible.

As a result of design engineering a substantial increase in production, in less space, was made possible. The machines are smaller and plant layout, storage and handling have been improved. New type of construction, made up of four sub-assemblies eliminates the use of bulky dollies. Freight costs have been cut because of cut in size and weight. A more sanitary machine has resulted. The re-engineered machines also have contributed to the lowering of price of the complete line of ice cream freezers and milk shakers. There is a 10-15 per cent reduction in selling price, based on capacity of machine.

Editor's Mail

→ *from Page 15*

PRODUCTS MANUFACTURING magazine. The Resumé of the talk by Mr. Henry Bund, Vice-President of Research Institute of America, was particularly interesting. I would like to obtain a copy of the complete talk if you have one available. If not, I would appreciate your sending me Mr. Bund's address so that I might write directly to him. Thank you for your help.

Hayward Thomas
Manager of Manufacturing
Plant #4
Frigidaire Div. of General Motors Corp.
Dayton 1, Ohio

Ed. Note: The address of Mr. Henry Bund is Research Institute of America, 589 Fifth Avenue, New York City. Mr. Bund informs us that complete copies of his talk will be released soon by the ARI office (Dupont Circle Bldg., N.W., Washington 6, D.C.). Late this year McGraw-Hill will publish a book by author Bund the working title of which is "The Changing Role of the Marketing Function."

Maytag article educational

Gentlemen: We have enjoyed very much the article published in Finish, August, 1956, concerning the Maytag industry. As part of our present curriculum in Ceramic Engineering, we make a field trip to the Newton plant and so have quite an interest in this operation. Would it be possible to obtain eleven copies of this article for use by our students currently taking our course in porcelain enamels?

Thanks very much for your attention to this request.

D. R. Wilder
Assistant Professor
Department of Ceramic Engineering
Iowa State College
Ames, Iowa

Ed. Note: We should like to acknowledge and thank you for your letter of April 5th. We are certainly pleased to learn that you found our coverage of the Maytag Company of interest. We are pleased to be able to comply with your request. Under separate cover, we are sending eleven reprints of the feature on Maytag.

northern neighbor values MPM

Gentlemen: Appreciate very much having my name on your mailing list to receive MPM. It is of great value to us in the appliance field, keeping us up to date and in touch with the rest of the industry. The articles are of great value. Once again many thanks.

Canada Westinghouse Co.
F. A. Bidwell
Plant #2
Longwood Rd., N.
Hamilton, Ontario, Canada

to Page 81 →

IN AUGUST MPM

Complete engineering details, including wiring diagrams, on the Servel Automatic Ice Maker.

Art Metal's automatic aluminum anodizing set-up

details on an automated system that provides finer quality, with little maintenance and higher production rate, for furniture maker

A LEADER in the field of office equipment for many years, Art Metal, who formerly bought chairs to go with the office desks and tables it manufactured, later decided to manufacture its own. At the time, the chief problem that came up was installing an anodizing system.

Art Metal knew little about details of the anodizing process. But it did know what it wanted — above all, an automated system. Manual anodizing is a physically taxing and unpleasant job that involves moving heavy metal parts through a series of hot chemical baths and cold water rinses. The company doubted the wisdom of trying to maintain a full force of responsible workers to do such work manually.

In addition, Art Metal was also seeking a uniformity of finish that would insure the quality of its product. From a production standpoint, the company also had to consider matters of space and resources to be set aside for anodizing in their overall chair program.

Conferring with supplier engineers, officials from Art Metal presented their problem in the light of the above requirements. Subsequently, an automatic conveyor that anodizes a unit load (maximum 30 lb.) of aluminum parts in approximately 80 min. was designed, built and installed. This conveyor is of the elevator, return-type design that has been used successfully for many years in electro-plating operations. Production rate is optional from 24 to 60 carrier loads per hr. depending on the desired thickness of oxide coating. The entire system is operated by one man, who places the parts on the conveyor, then removes them at the end of the anodizing cycle.

Elements of this automatic anodizing operation consist of a conveyor, a remote control panel, a motor-generator set and seven tanks, of varying sizes and construction that hold the various rinsing baths and anodizing solutions.

The conveyor employs separate forward and elevator lift drives. They move the material through the system and raise and lower it at the tanks.

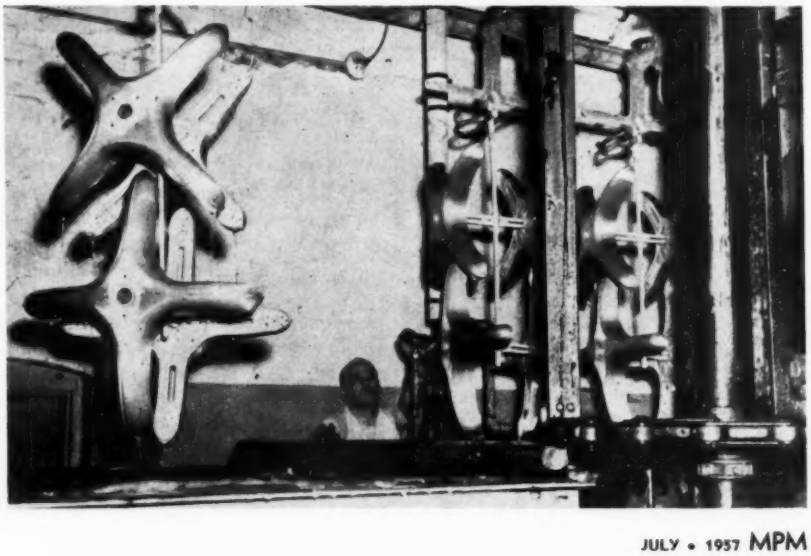
The conveyor has 44 carriers. Each will hold a maximum of 30 lb. of 61ST aluminum alloy chair parts, with one carrier handling several parts where weight and space will permit. For example, one carrier will hold one assembled leg chair, four swivel-chair bases, six backs of arm-type leg chairs or 40 leg brace pieces. The entire system will process a total anodized area of around 670 sq. ft. per hr. Current for the anodizing operation is supplied by an 400 amp. 25 volt motor generator set.

Transfer time (forward movement) from station to station is 30 sec. Immersion period (controlled by elevator drive) is 80 sec., although this may be adjusted from the control board to a range from 30 sec. to 120 sec. A 48 in. vertical movement of the carrier in the elevator insures total immersion of parts in tanks. Carriers are spaced 30 in. apart, which permits a maximum work load width of 24 in. (Six inch open space between carriers insures proper clearance at transfer points.)

Seven tanks are used in this anodizing system. In them, parts are cleaned, rinsed, anodized and sealed. All tanks are made of ¼ in. steel plate except the hot water seal tank, which is lined with stainless steel. Temperature controls, cooling and heating units insure maintenance of proper temperatures throughout the system. Stainless steel downdraft exhaust hoods, overflow weirs and suitable ventilation fans maintain proper ventilation and provide for a clean operation.

The complete system from start to finish is automatic. Controls are maintained by the operator at the control

ILLUSTRATIONS COURTESY HANSON-VAN WINKLE-MUNNING CO.



board located at the loading station. This remote control panel has stop and start buttons, on and off lights, starting controls for the forward and vertical conveying motors and a cam-operated electric timer that controls start and stop motions. Cutouts for electric switches and an electrical timer for varying immersion time are also provided.

How the system operates

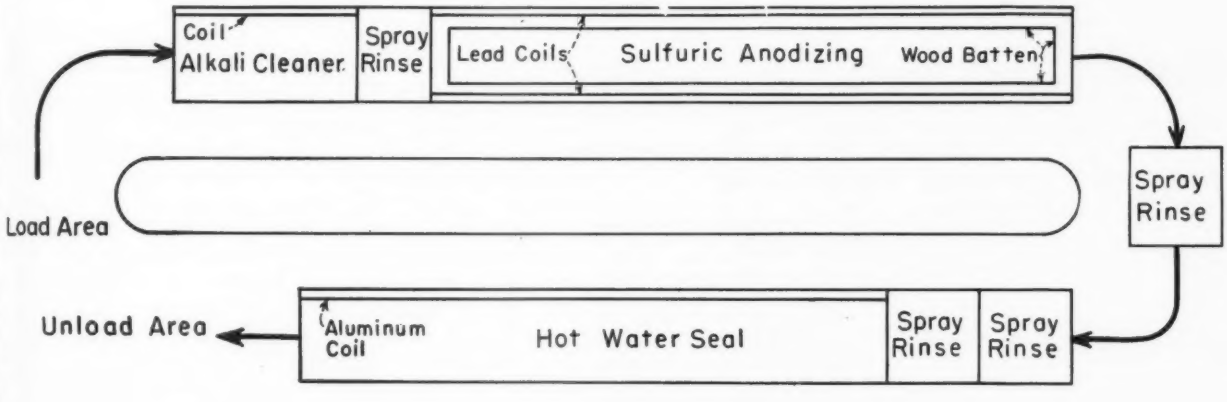
Let's follow the processing of a carrier load of aluminum chair parts through the anodizing operation. At the loading station the operator places the material on the carrier. The conveyor moves the parts first to the alkali cleaner tank; then the elevator motor takes over, and the material is lowered into the cleaner. Parts are cleaned of grease and other contamination in an alkali solution maintained at 200°F. by a steam heating coil mounted on the wall of the tank.

Processing time in the cleaner is 5 min. At the end of the 80 sec. immersion period, the material moves forward but does not leave the tank. Not until the end of the 5 min. period will the elevator drive take over, lift the aluminum from the tank and carry it on to the first cold rinse and top spray bath.

Here the chair parts are rinsed and sprayed for 80 sec. until all the alkali cleaner has been removed. Perforated steel pipe sprays the aluminum from both sides as it emerges from the tank. Then it moves on to the anodizer tank.

This tank, 40 ft. 3 in. long and 4 ft. 6 in. wide, contains a sulphuric acid electrolyte bath at a temperature of 70°F. maintained by 1800 ft. of lead cooling coils meshed along the sides of the tank. An air agitation coil is also mounted on the bottom of the tank. Material is immersed in this bath for 30 min., during which time the protective anodized coating is applied to the material. This coating will protect the material for years against the danger of corrosion and oxidation.

Next the carrier lifts the parts from the anodizer and carries them through three more cold water rinse and top spray tanks, for an immersion period of 80 sec. each. If material is to be dyed, it is removed from the system at this point. After dyeing, it would be returned to the cycle; otherwise, parts move automatically to the hot water sealing tank. Sealing time is 30 min. in hot water maintained by five aluminum steam heating coils with a total of 250 ft. of 1¼ in. IPS type 3S aluminum pipe. Following the sealing process, material is carried back to the loading station where it started, for inspection and unloading from the carrier.



Necessity for close coordination

A room 150 ft. long and 20 ft. wide was specially constructed to house the equipment. Ventilation and exhaust systems then had to be worked out in advance, since many of the components were assembled complete before shipment to Art Metal. At the same time, provisions for outlet and drainage facilities had to be coordinated, since the equipment was custom-built to fit Art Metal's particular needs and limitations of space and economy.

Actual installation of the system took about a month, and according to Art Metal officials, the preliminary planning and coordination that went into the system were well worth the time and trouble.

Little Maintenance — There has been no mechanical breakdown of any kind. Maintenance and part replacement have been negligible. Art Metal estimates that the mechanism will last many years without any significant depreciation.

Finer Quality — In addition to such maintenance and operating economies, the automatic anodizing system insures high quality and uniformity of the anodized product. Because the conveyor's timing mechanisms insure identical immersion periods for each part, all pieces spend the same amount of time in each solution. This insures a stability of processing that could not be guaranteed in a manual process.

Higher Production Rate — Automation also provides greater facility of operation and higher production rate. With automation, one worker can oversee the entire operation with virtually no physical fatigue.

Nor could manual anodizing equal the volume of work accomplished by the automatic system. Company officials estimate that their anodizing system realizes savings in manhours alone of around 92%, as compared to manual processing. Rapid flow of material through the anodizing process requires workers from chair fabrication departments to keep unprocessed parts moving into the system almost without stop.

Art Metal uses its special anodizing treatment as a selling point with prospective customers, stressing the production rate and uniform surface protection resulting from automatic anodizing. They feel that this equipment gives them higher production than could be achieved with any other anodizing system with which they are familiar.

Selling steel by telephone

story of a merchandising plan that grosses nine million dollars a year in steel sales

by Scott F. Burton • VICE PRESIDENT IN CHARGE OF SALES, ROLLED STEEL CORPORATION, SKOKIE, ILLINOIS

MPM TECHNIQUE FEATURE

THE SALESMEN at the Rolled Steel Corporation have averaged twenty to twenty-five calls on their customers per day for the past several years. This enviable record is the result of the sales system which the firm has successfully employed for most of its decade of business in the Chicago area — the selling of steel exclusively by telephone.

Our salesmen have assigned geographical territories which are more efficiently covered because sales calls are multiplied fivefold through use of the telephone over what could be accomplished by face to face selling. The company has found that it can give far greater service to customers in remote localities through regular telephone contact. They also can save expense in time, money, and manpower, and preserve good will by quickly terminating calls to customers who are obviously not in a buying mood.

So convinced are we that telephone selling is the most effective means of reaching our customers, that as much as $10,000 monthly is spent on phone bills. That is one of the largest commercial phone bills run up in the Chicago area. The telephone company has installed an automatic substation at the new Skokie plant. This substation, checked daily by the telephone company, is equipped to carry 200 lines. Salesmen need not go through an operator to place their numerous long distance calls.

The telephone selling operation works like this. Salesmen sit at their desks in a large salesroom that resembles considerably a stock brokerage office. On three walls of the salesroom are blackboards, ten feet high and 122 feet long. It is here that a complete running account of the inventory of steel products is kept up to the minute. A salesman can tell at a glance if he can meet the needs of the customer he is phoning. The board is marked by young men who receive notification of shipments on arrival.

As the steel arrives at the plant, duplicate IBM punch cards are made for each bundle. One card remains with the bundle until it is sold. The other, together with the bill of lading, is processed through the inventory control department to Sanford J. Shoen, executive vice president. Shoen prices the shipment and relays the information to the boys who record a complete description of the shipment, and the selling price, on the board. Thus within minutes after the shipment is received, the salesmen are in possession of all information necessary for transacting a telephone sale.

Records for 25,000 users

The potential needs of 25,000 manufacturers are kept up to date in two ways. Each salesman keeps a complete file on clients in his "territory" in his desk drawer for ready reference. Details on the steel requirements of all manufacturers on the mailing list are also fed perpetually to an IBM sorting installation. Within a few minutes after a new purchase is received at the plant,

View taken from sales office through executive offices into the plant, demonstrating feeling of openness. Executive has unobstructed view of his company's entire operation.

Opposite page: View of sales office from one of the executive offices. Executives have clear view of chalk board as well as operations on sales office floor. Chalk board extends 122 lineal feet around three sides of room. Moment-by-moment steel inventory is kept on board, and is easily seen by salesmen making calls.

we can obtain a precise picture of the market in the U. S. and Canada for any given item. IBM official George Stull says that the application of this equipment to record customer needs is unique.

Salesmen record purchases and potential steel requirements of customers they have called, and this information is transferred to IBM cards. As new items are added to inventories, the punch cards are run through the equipment to pinpoint those customers who might have need for the specific product. These customers are sent a flyer, multilithed on the spot in a company printshop and addressed by the IBM machine. In many calls salesmen are immediately notified which of their customers might be able to use the item. Incidentally, the punch cards also contain such data as birthdays and anniversaries of customers. It is part of the public relations program to send greeting cards on these occasions.

Order and IBM card, giving complete information on a purchase, are received in shipping room via pneumatic tube.

Sorting for purchasing, too

The sorting system has also been successfully employed as an aid in purchasing quantities of steel products. A check on the potential market for a specific item, for example, can be surveyed on the spot and the mill notified immediately. Company officials feel that this efficient means of categorizing manufacturer's needs not only accurately guides its own purchases, but performs a service for the mills as well.

When the sale is made, the salesman immediately erases or makes the proper correction on the blackboard, before making his next call. That way, there is no chance for sales on the same shipments to be duplicated by another salesman.

Phone costs average out to about $2 for each ton of steel sold, a considerable saving over the cost of in-person sales visits. We have also discovered that telephone selling is appreciated by customers. They like the business-like approach of the telephone salesmen. As a great deal of the time wasting, superfluous conversation is eliminated, a purchase can often be accomplished in five minutes. Through the use of the big board, there is no delay in communicating all pertinent data to the customer.

Good will calls in person

In addition to hearing the salesman's voice, the customer has the opportunity of meeting him personally several times a year, although in a non-selling situation. Company policy is to send salesmen on periodic trips to their territories so as to maintain some degree of personal contact. Incidentally, many salesmen have picked up the accent of the region they serve through such regular telephone contact. The salesman's face is known to customers through a "photostamp" which is attached to all customer correspondence, including the greeting cards.

Often it is less than an hour after the salesman has completed the sale, that the shipment is ready for pickup by truck or rail. During this time, the order is approved by the credit department, processed through inventory control where IBM card and work order is pulled, and sent by pneumatic tube to the shipping room. One of four seven and one-half-ton cranes secures the shipment from the proper storage bay and carries it to the shearing equipment, if necessary. Bays are laid out by gauge

Purchased steel is sheared to size to conform to order.

of steel. When the order is trimmed to size, it is wrapped and prepared for pickup.

When the truck arrives, the driver notifies the shipping room by means of an outdoor telephone which he can reach from his cab. He is told which of four ramps to use, or if all ramps are occupied, he is asked to wait until he is paged over an outdoor address system.

The new Skokie plant, designed by Architect Robert Friedman of Highland Park, Illinois, has been planned to fit the specifications of these established operating procedures. The tri-level principle employed not only creates an "airy" workable feeling, but also contributes to the overall functioning of the plant's operations. The sales office and the plant proper are on the ground level. About five feet above this level and separating the sales office from the plant is a row of glass-walled executive offices. From these offices, company officials have a clear view of the entire plant operation, and the salesroom and chalkboard as well. Thus both shipments and sales can be directly observed at will. The clerical staff is located one flight below the executive offices and a half flight below the sales office and plant level. Rolled Steel presently grosses almost nine million dollars annually.

Odd lots of seconds are measured by micrometer on arrival at plant. They are sorted by gauge and taken by crane to proper storage bay.

Rolled Steel was founded in 1946 by Seymour Waldman, a young veteran, then a student at Northwestern university. Upon his return to college, Waldman learned that the War Assets Administration was offering veterans surplus steel with thirty days to pay. Waldman applied for and received several such awards, rented desk space, obtained a list of steel buyers, and was in business. He sent out lists of the steel he had on hand at a public warehouse, and started experimenting with telephone selling. He netted $13,000 in this part-time pursuit in that first year, and upon graduating, went into the steel business full-time. Waldman migrated from one make-shift office to another, finally buying his first warehouse in 1951. He still maintains this Skokie warehouse in addition to the new tri-level structure opened in October, 1956. A warehouse is also operated in Houston, Texas, to facilitate better service to the Southwestern sector of the country.

On other end of wire, truck driver stops for instructions. He can use telephone without leaving truck.

Operations manager gives loading instructions by telephone to truck driver arriving for pickup.

"This galvanized sheet takes any operation...

without cracking or peeling the zinc coating...

saving a further 'finishing' operation because...

Wheeling sofTITE has the tightest zinc coating yet produced"

What makes Wheeling sofTITE different from other galvanized sheets? Just ask any manufacturer or sheet fabricator who has tried them.

They'll tell you that Wheeling sofTITE takes draw, every spin, every tortuous operation without ever cracking or peeling. That's because sofTITE is ductile, so it's easy to work. At the same time it has the tightest zinc coating yet produced. That's why sofTITE products look so good, last so long and save manufacturing costs.

If you would like to enjoy all these advantages, make a note right now to try Wheeling sofTITE Galvanized Sheets.

Call your Wheeling industrial supply distributor, the Wheeling sales office nearest you, or write Wheeling Steel Corporation, Wheeling, West Virginia.

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OUR CHALLENGE STANDS: ANYTHING THAT CAN BE MADE OF STEEL SHEETS CAN BE MADE OF WHEELING sofTITE GALVANIZED SHEETS

Buick uses CO_2 arc welding for pedal assemblies

gas shielding proves convenient, and joints are rapidly made — one automatic machine has dual heads which produce 200 assemblies an hour

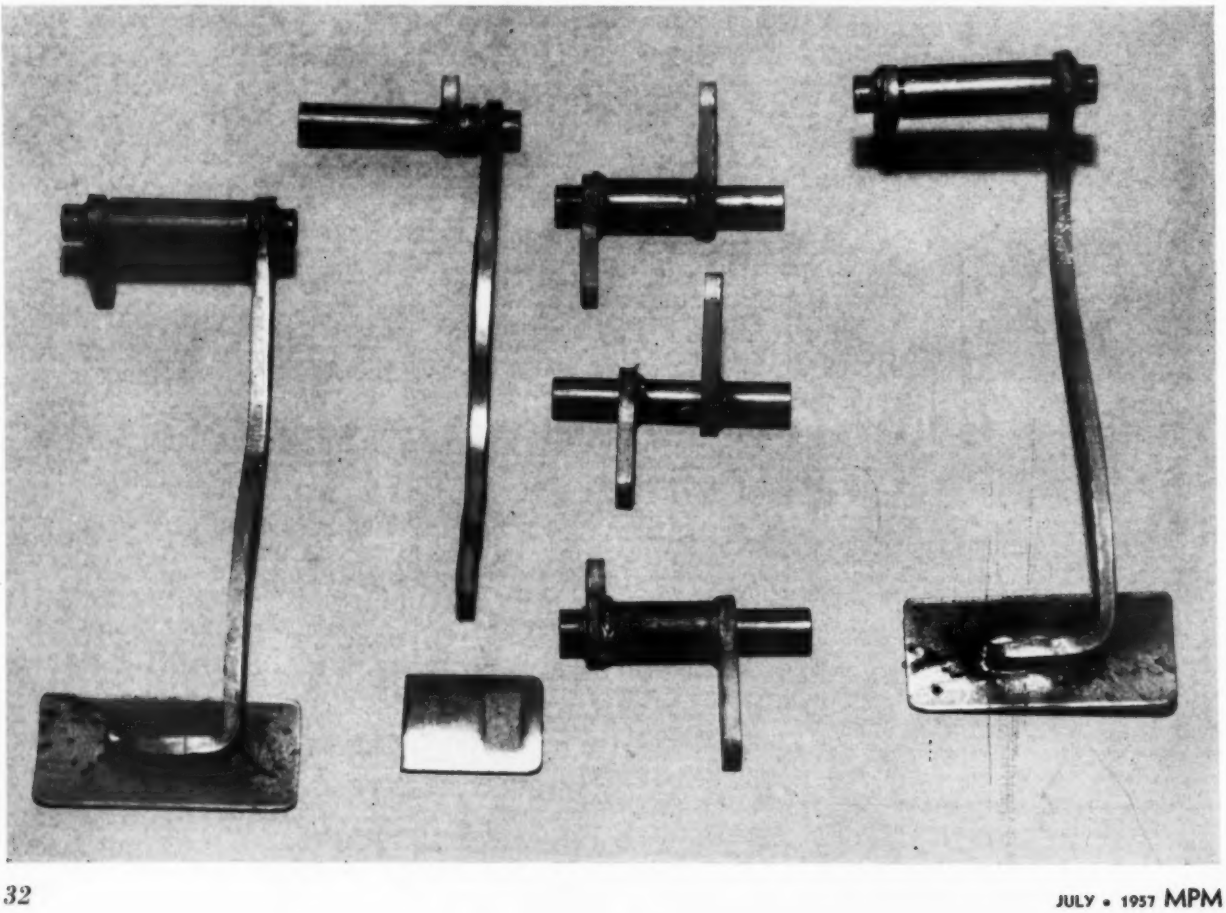
by Herbert Chase • M.E.

ABOUT a year ago, Buick Motor Division, at its plant in Flint, Mich., began using automatic arc welders in which carbon dioxide is employed as a shielding gas. This gas has the advantage of low cost and, as in other inert gas shielding, is convenient to use because no granular flux is needed. It is necessary, however, to use a cabinet or curtain to keep the light of the arc from the eyes of workers in adjacent areas.

Nine machines of this type are currently in use for production of the pedal and shaft assemblies shown in Fig. 1. Each machine receives CO_2 from a shop line leading to an outdoor storage tank, this having replaced bottle setups adjacent to the machines.

Fig. 2 shows one setup in a welding machine. A stepped shaft is welded in this machine to a short lever that fits against a shaft shoulder. Only one electrode holder, inclined at about 45 deg.,

Fig. 1 — Each of these pedal unit assemblies for Buick cars is a result of automatic arc welding in which CO_2 is used as a shielding gas. Welding is done at a high rate (about 4 seconds for the average weld itself.)



is needed, and 0.045-in. diameter wire feeds through the holder as welding proceeds. Components are first hand clamped in a rotating fixture with the shaft axis vertical and in line with the axis of rotation.

Welding takes place automatically and starts when, upon pressing a start button, gas is turned on and the fixture starts its rotation.

Welding requires only 4 seconds but the total cycle time, including loading and unloading, is 15 seconds. In this case, the weld covers a complete circle plus a slight overlap. Shielding gas flows, of course, only during the welding part of the cycle. Other jobs are done on this machine, some after changes in the angle of the electrode guide. Welds are ¾ inch and 1⅛ inch diameters.

Quite similar is the setup, Fig. 3, but it is in a different type welder using a different make head and transformer. Work is supported on a similar rotating fixture. Welding starts as soon as the door of the cabinet is closed and continues automatically for about 4 seconds. This produces a circular weld, the 3/64 inch electrode wire receiving about 300 amp at 28 volts. Gas flow is started and stopped by an automatic control. Other machines, the same as that just described, make similar welds at the other end of the tubular shaft.

Welding of pedal shanks to pedal pads 1/8 inch thick is done on an arc welder setup, Fig. 4, in which two heads are employed. Two longitudinal welds are made over a 2-inch length, one on each side of the end portion of the shank that is previously bent to a right angle with the long curved portion of the shank. (See Fig. 1). After air clamping in the position shown in Fig. 4, direct current from two constant-potential transformers is applied and the two heads, which are mounted on a slide, are traversed forward, strike the arc and make the two welds simultaneously in about three seconds while CO_2 is fed automatically to shield the arcs.

At the end of the traverse, current is shut off, the 1/16-inch diameter electrode wires are retracted slightly, and the heads are given a rapid backward traverse, leaving the weldment ready to be unclamped and removed and completing the cycle. About 200 assemblies an hour are produced, this including, of course, the time for loading and unloading, which time totals some 75 per cent of the cycle. An asbestos curtain (removed when the photo was taken) is used to hide light from the arc.

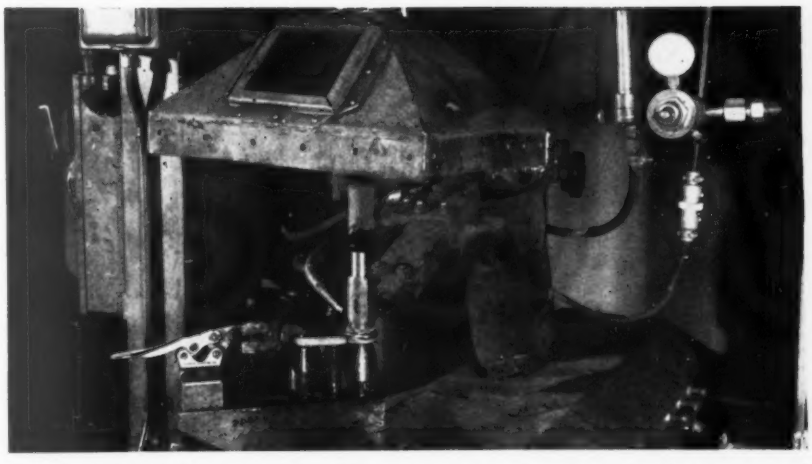


Fig. 2 — Arc welding of a short lever to a pedal shaft with CO_2 shielding gas fed from a shop line via a control valve and through the tube at the left of the weldment.

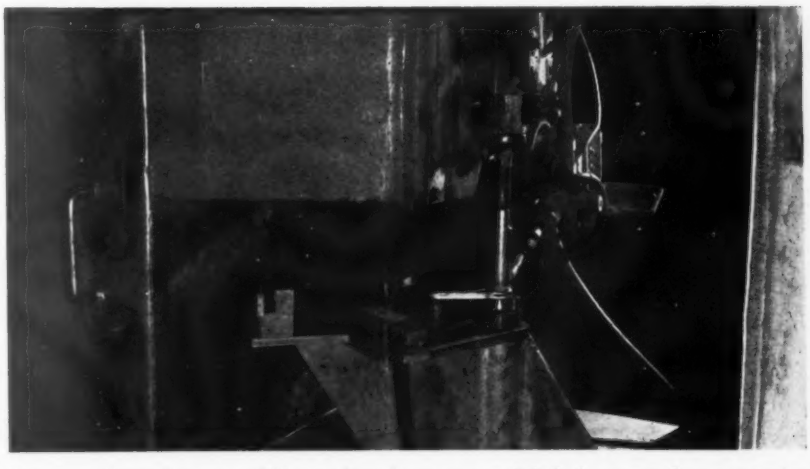


Fig. 3 — Setup for arc welding a short lever to a pedal shaft mounted on a rotating fixture in an automatic welder, the arc being shielded with CO_2.

Fig. 4 — Double-head gas shielded automatic arc welding setup that makes two straight line welds that fasten a pedal lever to a mating pad.

MPM Suggestion Box

you can use existing steam supply for steam cleaning, paint stripping, phosphatizing, and sanitizing with . . .

Simple steam cleaning equipment which has many maintenance uses

DEVELOPMENT of the "Steamerette" — an injector unit that uses existing steam supplies for steam cleaning, paint stripping, phosphating, or sanitizing, has been announced. The new equipment is said to provide complete steam cleaning facilities for a fraction of the usual cost.

The Steamerette is easily operated, requiring only the adjustment of one valve. It will operate anywhere in the range of 40-140 psi steam pressure, and has a powerful impinging force at all pressures within this range. A built-in pressure gauge indicates the operating pressure, and eliminates fluctuation to assure uniform cleaning. Quantity and pressure of solution at the nozzle may be varied to provide every type of delivery, from a slow full stream at moderate temperature, to a hot driving blast for heavy cleaning.

Since there are no pumps, motors, or complicated equipment, maintenance is minimized and, according to the manufacturers, the unit will not clog or overheat, even under the most adverse operating conditions. The portable unit is quickly attached to any steam line maintaining an open pressure of 40 pounds or more.

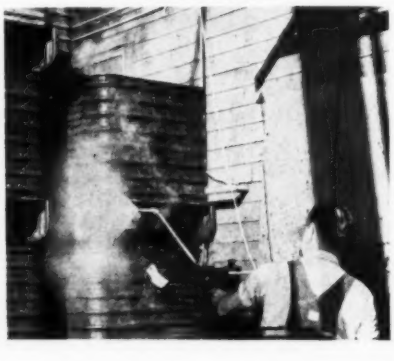
Dry steam alone will not clean satisfactorily. For efficient cleaning, steam must be converted from its comparatively dry state by the addition of water and a suitable detergent. The Steamerette uses steam to pick up and heat the cleaning solution, and to furnish velocity. It is the first device to successfully apply the principle of combining four essentials of economical, efficient cleaning—*heat, water, detergent, and impingement.*

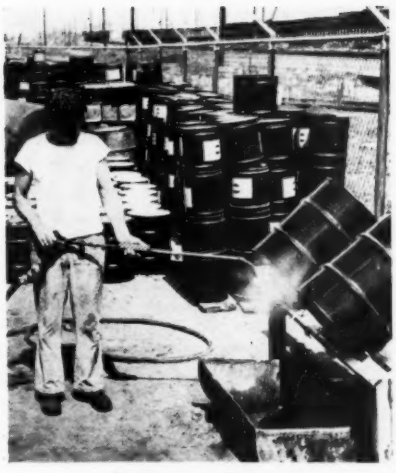
The method is suggested for cleaning and sanitizing plant walls, for cleaning plant floors, and for outside building maintenance; also for cooperage, metal pallets and pallet boxes, and similar products.

For additional information write to Special Features Editor of Metal Products Manufacturing, Elmhurst, Ill.

Building maintenance

Plant maintenance





Cooperage cleaning

Fred D. Fisher **— is known to many appliance manufacturers, particularly in the gas appliance field. He was born in St. Louis, attended the University of Illinois, graduating with an AB degree in Business Administration. Age can be judged from the fact that his football stint at Illinois was in the days of Red Grange. One of Fred's early businesses related to the scientific approach to the adjustment and relining of automobile brakes. In 1944, a part was developed for the jelly gasoline bomb. What started as a side line eventually led to the development of Configured Tube Products Company.**

MPM PHOTO

The company introduced the steel tubular venturi tube for use in a variety of gas burners and, later, the single-port burner made of tubing for the appliance industry.

The company developed machines and machine tools to make special tubular sections such as the tail tube assembly for the M-47 jelly gasoline bomb. Within a span of seven months production went from 0 production to a production of 80,000 parts per day.

Having specialized in much needed products for defense, Fisher then naturally turned to uses for the specialized knowledge and equipment for civilian manufacture. The resulting products are described in an article entitled "Flow coating tubular metal furniture" which starts on Page 44 of this issue of MPM.

"With Weirkote® you can forget plating or dipping after fabrication. It just won't peel or flake!"

Q.—Weirkote—is that a new kind of steel?

A.—*"New" only to those who don't know of its advantages. It's a zinc-coated steel with a skin-tight surface, produced by a continuous galvanizing process instead of the old pot-dip method.*

Q.—Well, we've tried galvanized before for the parts and products we make. But it just couldn't stand up under the punishment of fabrication.

A.—*Must have been the old type galvanized. When you use Weirkote for fabrication, you'll find its surface stands up under the severest stresses. Punch it, lock it, crimp it, deep-draw it—its zinc coating stays intact. It's got a* built-in *resistance to peeling and flaking.*

Q.—Well, say—that'd save all the cost of plating or dipping after fabrication, wouldn't it?

A.—*Exactly! Plus assuring you a* uniform *protective coating at all times—something even a special coating doesn't always provide on the more intricately fabricated parts.*

Send today for free booklet that details the time- and cost-saving advantages of using skin-tight zinc-coated Weirkote. Write Weirton Steel Company, Dept. R-1, Weirton, West Virginia.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA
a division of
NATIONAL STEEL CORPORATION

Veiling gives distinctive finish to porcelain enameled barbecue kettles

A METHOD of porcelain enamel decorating, known as "veiling," is being used by the Benjamin Electric Manufacturing Co., Des Plaines, Ill., to provide a distinctive finish for "Weber" covered barbecue kettles which are porcelain enameled in the Benjamin plant.

The veiling process utilizes a special mixture of enamel and oil in tracing a pattern of narrow lines, interwoven in curves and loops to produce the "veil" effect. The "veil" is hand sprayed over a pre-porcelain enameled surface. It is similar in effect to a finish commonly used in organic finishing.

The finish of the kettles is meeting enthusiastic dealer and consumer acceptance, according to George Stephen, vice president of the Weber Bros. Metal Works, producers of the barbecue equipment. The finish consists of a base coat of black porcelain enamel followed by a "veil" of white porcelain enamel. The base coat is applied to both the inside and outside of the kettles to provide a durable, rustproof surface before veiling.

Termed "veiling" by sprayers because of its delicately traced pattern, the process involves shooting a fine thread of fluid from a spray gun to the surface being veiled. A variety of metal products now employ this process.

Low pressure spraying

The kettles are made at Weber Bros.' Chicago plant and shipped to Benjamin Electric for finishing. After unloading, they are moved immediately to an 8-foot dry floor-type ceramic spray booth, where both the base coat and veiling are applied. The base coat is hand sprayed in the standard manner with standard spray guns using external mix type nozzles. However, both fluid and air pressures are lower than in normal spraying applications.

The veiling process differs from standard spraying operations in two important respects — the amount of air pressure used, and type of nozzle. The spray guns are equipped with internal mix type nozzles for the Benjamin operation. Air pressure is kept even lower than for the base coat, ranging from 2 to 5 pounds. The fluid pressure almost equals the air pressure.

Although internal mix nozzles normally cause atomization of the material inside the head of the spray gun, the low air pressure used in veiling prevents atomization from taking place. Fluid pressure forces a thin, solid line of enamel out of the gun. Exterior slits around the nozzle emit just enough air pressure to slow down the stream of enamel for smoother, easier application.

In standard spray application, internal mix-type nozzles are generally used, and air pressure is kept 4 or 5 times greater than fluid pressure. Atomization takes place outside the gun. In veiling, atomization does not occur, and the solid enamel stream provided by the reduced air pressure can be woven in a variety of fascinating patterns.

At the Benjamin company, veiling is done at two enameling stations, in one large spray booth. The kettles revolve on a turntable in front of the operator, offering easy spray accessibility to all

A completely finished Weber barbecue kettle. The finish is produced by "veiling" a pattern in white procelain enamel over a base coat of black porcelain enamel. The finish is fired at a temperature of 1550 degrees Fahrenheit. Inset: In veiling, a thin line is traced in delicate, interwoven patterns over the pre-enameled surface. Air and fluid pressures are kept nearly equal.

The barbecue kettles receive their distinctive finish in an 8-foot dry floor-type ceramic spray booth at Benjamin Electric Manufacturing Co. Here, operator is applying a "veil" of white porcelain enamel to kettle bowls as they revolve on a turntable.

surfaces. When applying the veil, the spray operator holds the gun at a greater distance from the surface than in standard spraying operations. The exact distance is determined by the pattern to be sprayed. To keep the veiling stream from building up at any one point, the speed of gun movement must be controlled.

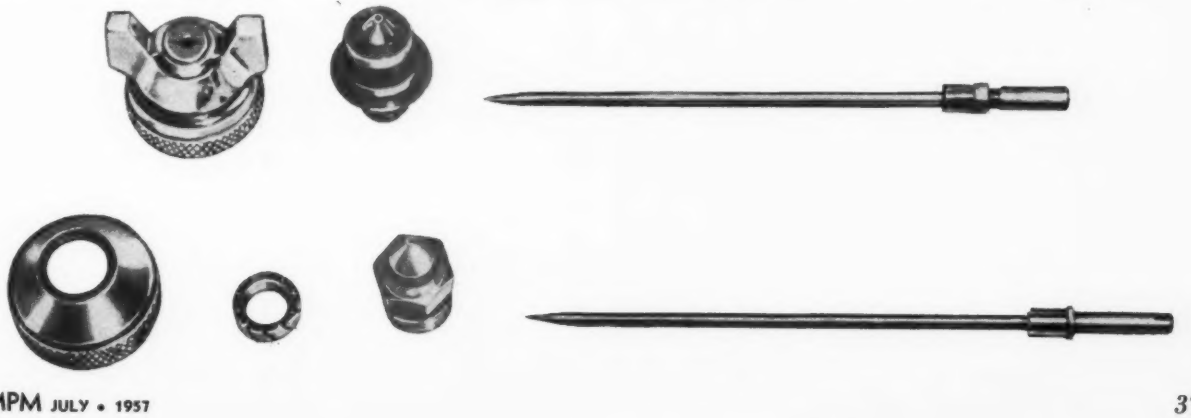
As might be expected, the viscosity of the enamel used plays a major role in determining the speed of application.

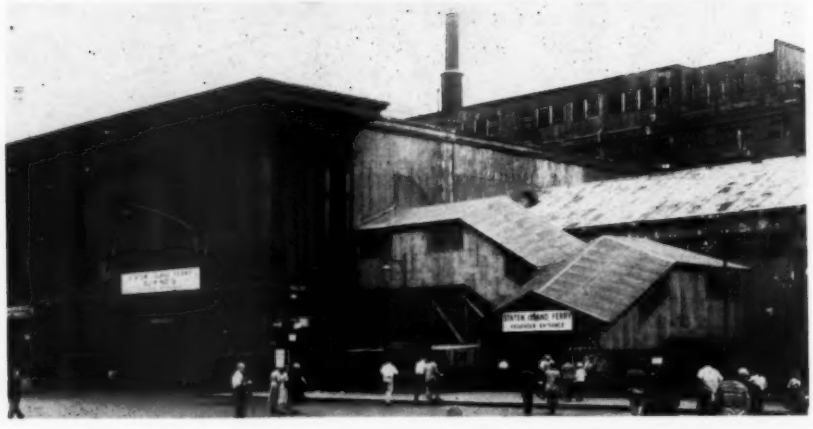
Viscosity is important

To prevent build-up, heavier materials require faster application than is required by less viscous mixtures. Although the speed of application is somewhat faster than in standard spraying operations, the internal-mix nozzles keep the mixture coming out of the gun in a controlled stream. This prevents the speed of application from becoming a difficult problem.

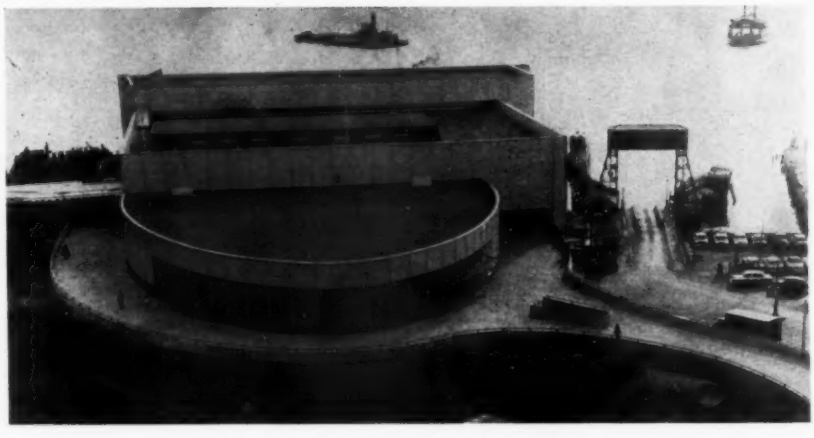
After the veiling operation, the kettles are dried, then passed through the firing furnace at approximately 1550 degrees Fahrenheit, where the base coat and decorating are fired simultaneously.

Difference in types of spray equipment required for veiling, and that used in ordinary spray applications, is shown below. Standard equipment at top includes external mix-type nozzle, .052 orifice, and standard length and diameter needle valve. At bottom is nozzle cap, core nozzle, internal mix-type nozzle, and thinner needle valve used in veiling application.





New York's Whitehall-South Ferry terminal before remodeling with porcelain enamel panels by Ingram Richardson Manufacturing Co. Extensive repair work was done to prepare building for new curtain wall face.



Now the 50-year old Whitehall-South Ferry terminal is a modern-appearing structure. 50,000 square feet of porcelain enamel panels were used in the remodeling, and extruded aluminum sections were added to seal vertical joints.

Terminal gets new curtain wall face

PANELS by Ingram-Richardson Manufacturing Company are a feature of the largest porcelain enamel on steel curtain wall remodeling project yet completed by the company. To modernize the 50-year old Whitehall-South Ferry Terminal in New York City, Ing-Rich manufactured and erected 50,000 square feet of insulated porcelain enamel panels.

The Whitehall-South Ferry Terminal is at the southern tip of Manhattan. It is the main commuter link between Staten Island and New York City, handling as many as 250 pedestrians per minute — serving more than 1,500,000 vehicles per year.

Remodeling work was planned so at least two slips could be kept in continuous operation.

Although still structurally sound, the two terminal buildings and connecting unit were in various states of disrepair. In remodeling, the structural framework was retained, but masonry and sheet metal work was stripped off and replaced by 2,700 individual porcelain enamel panels. Light blue-gray porcelain enamel was used to produce a modern-appearing, curtain wall building.

Since the terminal is subject to repeated jarrings when boats dock, special aluminum and porcelain enamel cover strips were designed to interlock with the backing on the panels, allowing a little "give" to the facing.

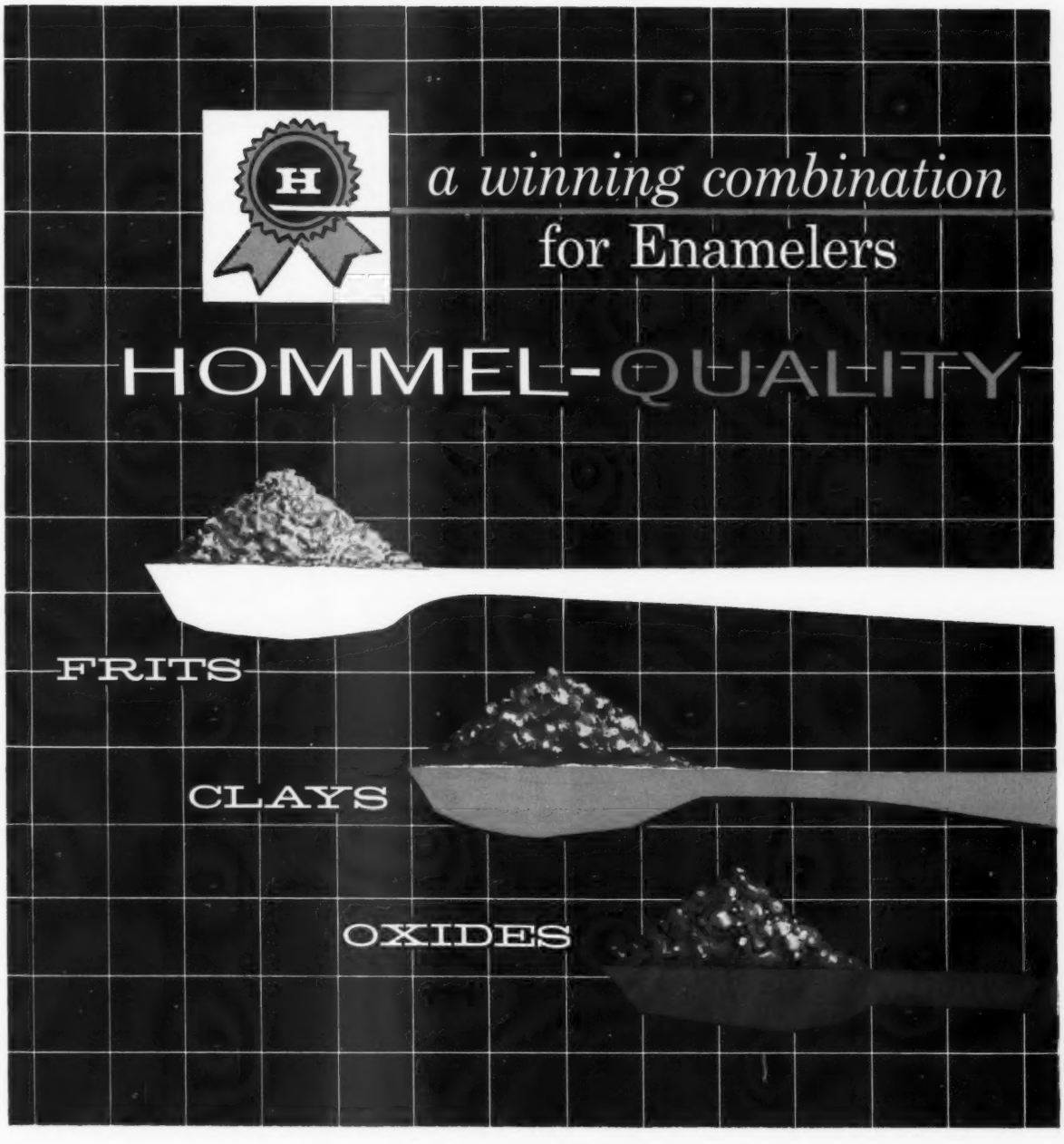
Approximately 10,000 square feet of non-insulated panels by Ingram-Richardson were used for interior service in the connecting structure.

Panel details

Individual panels were composed of 16-gauge porcelain enameled steel face with flanged edges for attachment. To insure surface flatness, a core of 7/8" marine plywood was laminated to the inside of the panel face, with an 18-gauge galvanized steel back sheet also laminated to the plywood. Panels were produced in a variety of sizes, the largest being 3'5" by 7'9".

Erection details

Steel channels were welded to the existing framework as a girt system. Panels were mounted on girts by special clips and stainless steel screws. Sealing compound was placed between the girts and the panel back to make the job weather tight. All vertical joints were covered by extruded aluminum sections, giving the appearance of mullions extending from roof to ground line. A layer of sealing compound was also used between the mullions and panel faces. Horizontal joints were closed with strips of porcelain enamel channels screwed directly into the steel work, with joints sealed for weather protection.



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Short cuts in fabricating-finishing oil fired home heating units

a story of plant operations at Rossoe Manufacturing Company, Seattle, Washington

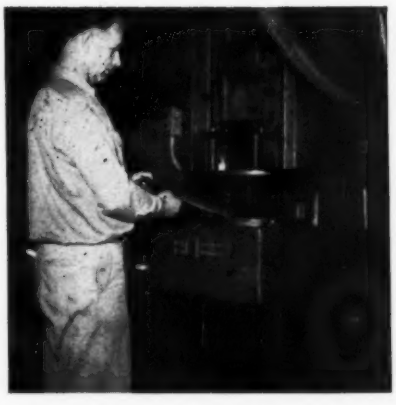
SOME 375 home heating units represent the monthly production to be fabricated and finished at the Rossoe Manufacturing Company, Seattle, Washington. These units represent quite a diversified line of automatic, oil-fired, home heating equipment. They run from the smaller floor furnaces to the larger basement type oil heating equipment rated at 450,000 BTU.

Short cuts in fabrication are accomplished in shearing, braking, punching, rolling and welding. Here is one example of each:

SHEARING — Two men use a 10-foot shear, as it has been found that they can do the cutting in less than half the time it would take one man. The men make an efficient team and specialize in the work. First they place the sheets, stacked on the floor flanking the shear, upon four-wheel wooden trucks. Two trucks are used. The loaded truck is placed parallel to the shear and the sheets are then cut to width on the front and back gages, lifted over the loaded truck and set on a second truck parallel to the first truck and the shear. When all the sheets have been cut to width, the two trucks are swung at right angles to the shear, the squaring gage taken off the shear, and the sheets cut to length. Again the two trucks are used. The cut-to-width material stacked on the rear truck is lifted upon the empty truck in front and fed into the shear where it is cut to length and left on the truck. The men have figured out how to cut various sizes and gages of material to length and width, and when through, have them stacked neatly on one truck for delivery to the power press brakes or punch presses.

BRAKING—Two men are often used on the power brakes where they are faster than one man taking more than twice as much time. One example to be cited concerns one man using a 10 foot press brake to perform a punch press operation. By means of a fairly-large multiple-die, and with only one stroke of the ram, he punches four corner notches, a large square hole (for burner), a medium-sized round hole (inspection plate), a smaller round hole (controls), a small, round hole (fan control), and two pin-sized round holes (name plate) — all out of a 22 gage cold rolled sheet (for furnace fronts). Thus, almost as fast as he can load and unload the sheet, the operator gets all those "braking" — really, punching jobs done.

PUNCHING — This example has as much to do with using scrap as it has with speed . . . but the two go together. Short, rectangular pieces of 14 gage hot or cold rolled steel scrap from other operations are fed into a 135-ton punch press to knock out one-fourth of a 22½-inch circle needed for furnace heat exchangers. (The company would have no use for the large inner disk if it were to blank the entire circle out of a large plate). At the same time that the one-quarter circle is cut out, the stops on the press die have been set so that the inside portion of that circle is cut to the right diameter, and can be used by cutting off a small part of both ends, as a neces-



Above (left) — Concaved shape is given to furnace body ends of 12-gage steel by forming them in this 85-ton press. Above (right) — Cutting ventilating elbows and forming the bead on an "elbow machine." Drills, below (left), band saws, and gang drill along the machine shop wall. Equipment in foreground drills burner housing. Below (right) — Underground oil storage tanks are rolled in power rolls and then welded as in photo. Heads are welded first.

sary part to be welded on the heat exchanger. Thus, two parts are really cut out with one stroke of the machine . . . and scrap is taken care of at the same time.

Racks, trucks, and dollies play a prominent part in fabrication. A good example is the large furnace casings (that have louvres punched out in each end in a 6-foot brake) neatly stacked on four-wheel racks by the operator (while the helper inserts the next panel through the back of the brake . . . saving time).

ROLLING — Minutes are saved in rolling 12 gage collars for furnace bodies when six to eight of the small collars are rolled one after the other along the 4-foot rolls, then the entire bunch slide off at one time instead of singly.

WELDING — Here the best examples of faster production are the automatic turntables, built on wheels for mobility, which are used for welding the heat exchanger pieces (the four-to-a-circle already mentioned) to the top and bottom of the exchanger. The welder, using a 6-11, AC-DC reverse rod with an AC welding machine, can turn out 27 exchangers a day as against 22 a day without a turntable. The turntable is equipped with a 1/6 hp motor, gear box, and pressure clutch with variable-speed pulley. (The variable speed is used because there are two different-sized circles which require different speeds on the exchanger).

So much for examples of time saving in fabrication. Now take a look at the finishing operations.

Shear team work. Material is stacked on truck nearest to 10-foot shear. After it is cut for width it is lifted over first truck and placed on second. Material here is 22 gage for furnace casings.

One-fourth of 22 ½-inch circle needed for furnace heat exchangers plus a second part from inside the ¼ circle, is cut out from scrap on this 135-ton punch press.

Nine six inch louvers, with ½ inch draw are punched out of 22 gage cold rolled steel in each end of furnace casings, on this press brake. Note method of handling fabricated parts.

Everything must be painted — inside and out

By means of fast handling methods to assure constant flow of completed units through the paint shop, one "painter" with one helper can keep production flowing on schedule.

Paint procedure is singularly free from complexities. As parts come from the press brakes, punch presses, spot welders, or elsewhere in fabrication to the finishing area, the helper stacks individual pieces on four-wheeled racks, or places the burners on trucks, on one side of a 14 by 30-foot water wash booth. (The booth has one 16,000 CFM blower, to a single connecting outlet). The assembled units are already waiting for him on the opposite side of the paint booth. A hoist on an overhead rail has lowered the bodies into the units which rest on four-wheeled dollies. As needed, it is his duty to wipe the parts or units with etching solution to remove dirt or grease, then pull the racks, trucks, or

Wheeled automatic turntable, used for welding heat exchanger circle pieces, has variable speed required for two different size circles.

Six to eight 12 gage furnace body collars, rolled one after the other, are all removed at the same time from the rolls.

dollies into the paint room . . . all parts or units going in the same side door and, after painting, out the opposite side door.

The individual pieces, burners, or units are fed through the paint room in batches so that the painter can concentrate on one type of part at a time and avoid changing spray guns. One or two racks, trucks, or dollies, with pieces, burners, or units as the case may be, are always ready for him in the paint room.

Some small panels and doors wheeled into the room on racks are placed two or three at a time on a turntable for spray painting, then removed and laid horizontally in a multi-shelved, four-wheel rack which holds an average of 24 medium-sized panels. The original rack used for transporting the panels and doors to painting is pushed on through the room to the rack storage area. Finished panels and doors on their shelved racks are pushed into the main storage drying area.

Although everything is air dried, there is no piling up of racks along the way, and only a few racks, dollies, or trucks must be held in the drying area at the end of the day. (During peak production, two assembled units are put on each dolly to conserve space and cut down on the dollies in transit).

Little masking of the units is required except for doors, as on the utility room model, and this is simply done by means of masking tape and paper.

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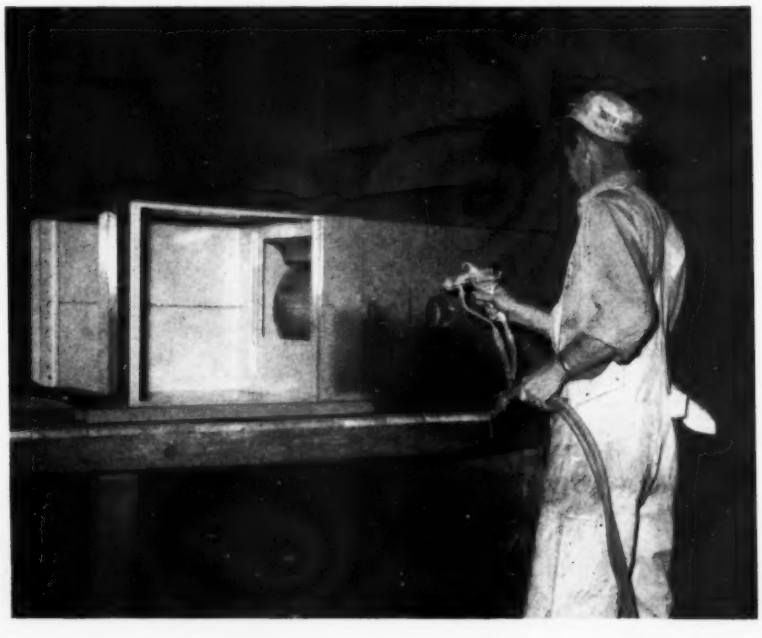
Fan partitions of 22-gage steel get inside coating of aluminum lacquer before glass fibre insulation is installed.

After spraying inside horizontal suspension units with aluminum, painter sprays outside with bright copper enamel, with pot pressure at 20 pounds psi, nozzle pressure at 50 pounds psi.



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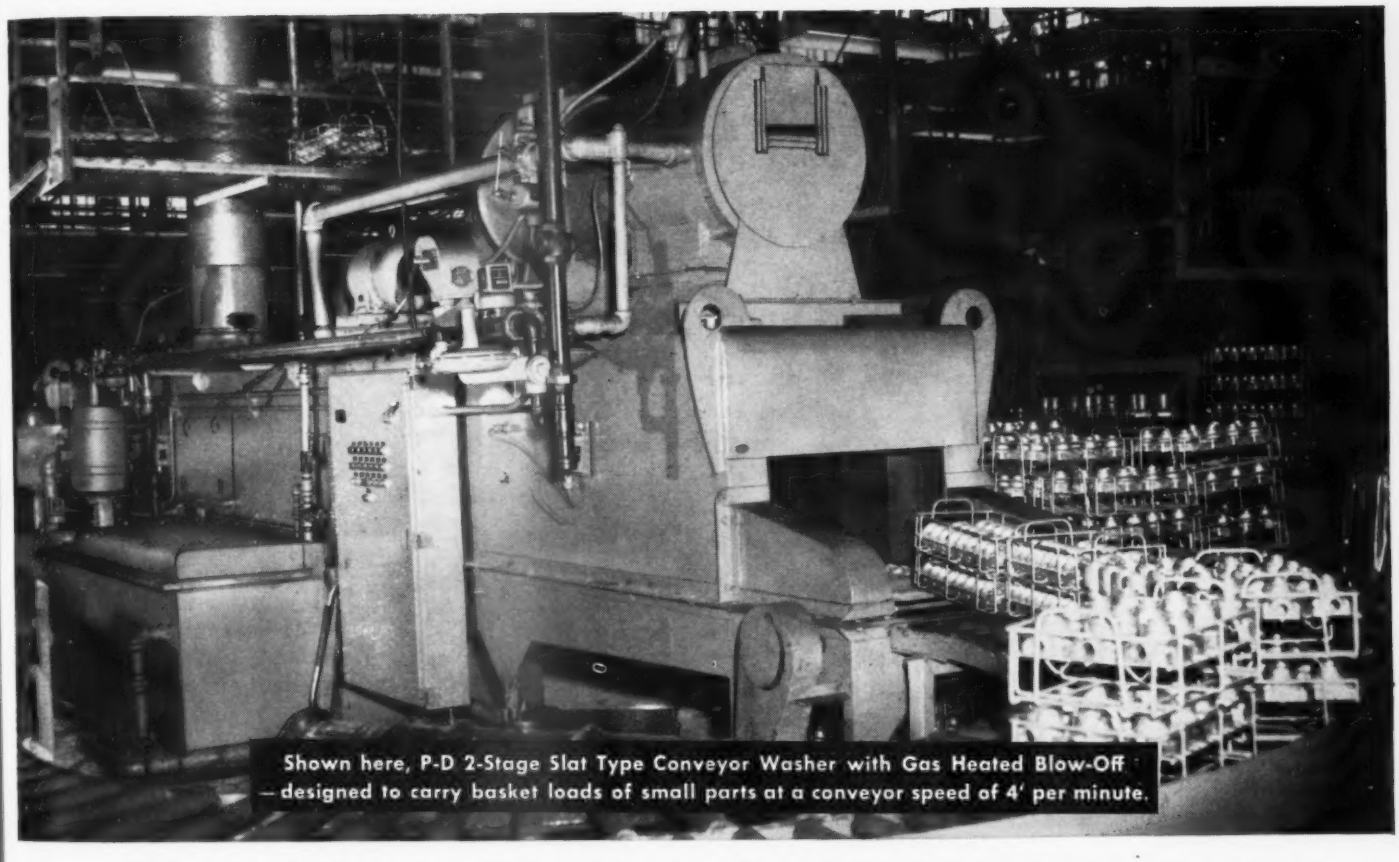

Shown here, P-D 2-Stage Slat Type Conveyor Washer with Gas Heated Blow-Off —designed to carry basket loads of small parts at a conveyor speed of 4' per minute.

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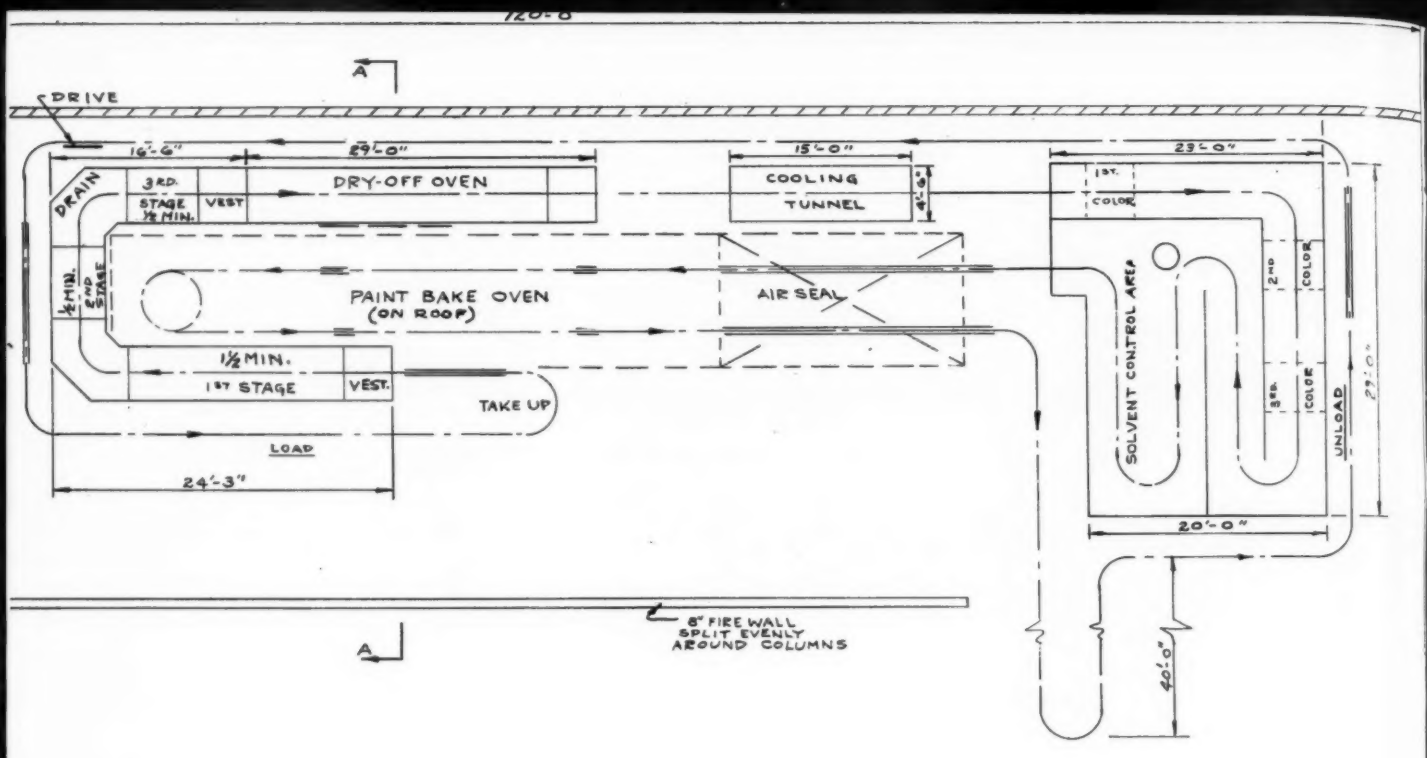


Flow coating tubular metal furniture

A Dictet report to the editor of MPM

by Fred D. Fisher • CONFIGURED TUBE PRODUCTS COMPANY

MPM

OF OUR THREE affiliated companies which operate under one roof at our Bellwood, Illinois address, Configured Tube Products Company is the one responsible for the fabrication of metal furniture frames and legs for dinette sets and other furniture, for the fabrication of single port burners for industrial appliances, and for the production of push rods for Pratt & Whitney aircraft engines. Much of the equipment in our plant, (I'm referring to the machine tools,) is a result of our own development. The equipment consists mainly of tube shaping machines that roll shapes into tubing for almost any design that can be put into a tubular section. This includes any shape within the limitations of the flow of the metal.

The method of fabrication

The push rods for aircraft engines are our own development. They are made of polished steel and shaped on the tube shaping machines in the same manner that mild steel tubing is formed. The reason for the success of this method is that the tube shaping process forms a more homogeneous mass of the metal, resulting in a stronger cross section.

Multi color finishing of tubular products

Another division of the operation here is the Douglas-Fisher Corporation, a company which was set up to finish metal tubular products in a variety of organic finishes. We are currently running black, brown, and grey finishes, but it is contemplated that other colors may be added later. The system consists of a completely-conveyorized installation which was selected after a thorough investigation of many available systems. Direct fire infra-red gas burners are used as a heat source in both the dry-off oven, and for the baking room. This equipment, in our opinion, provides a consistent and easily controllable heat source to meet our requirements. The finishing system is fully automatic in that the fabricated units are placed on a conveyor line just as they come off the benders, which carries them through cleaning and metal preparation, the dry-off oven, the cooling chamber, a flow coating unit, a baking oven at ceiling level, and then down to the unloading and packaging section of the plant.

Three stage metal preparation

The cleaning and metal preparation section of the system consists of three stages providing for one and one-half minutes in a phosphatizing wash, a 30-second rinse, and a 30-second chromic acid etch. The spray method is used throughout this unit.

Parts then pass through the infra-red fired dry-off oven for two and one-half minutes at 250° F., and then through a 15 ft. cooling chamber to reduce the temperature of the metal to a point approaching the temperature of the finishing materials.

Three-color flow coat machine

The parts then pass through the flow coat machine which gives them a bath by literally presenting a "wall" of paint. The flow coating equipment actually consists of three separate flow coating systems; one each for the black, brown,

and grey colors. A multiple-nozzle system is employed.

The paint is pumped from drums direct to the flow coating circulation system, and paint supply and drains are arranged so that a rapid change can be made from any one to another of the three colors. We believe it is the first machine designed for multi-color application and, at the same time, provides for extremely-rapid changeover from one color to another (from 5 to 10 minutes). For example: for a changeover from grey to brown, the grey system pump is shut off, a drain board is folded back, and the drain board for brown is lowered in place to carry the liquid to the proper reservoir. No hook cleaning is necessary, except after build-up. After the paint is applied, the parts continue on through the solvent control tunnel (controlled vapor drain zone) to preset the paint.

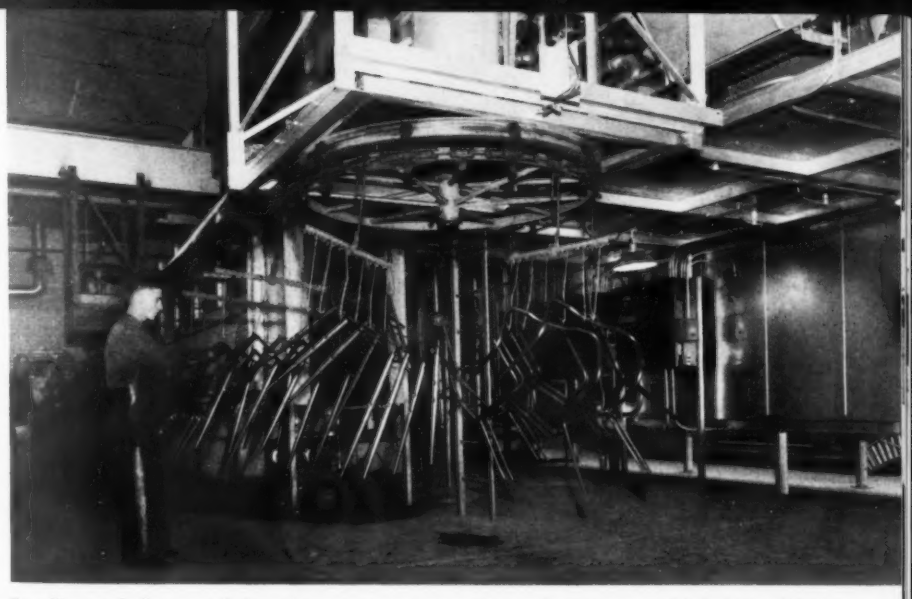
From the flow coat section, the ware travels in the open to the point where it enters the baking oven at ceiling level. The reason that the oven was located at ceiling level was that it makes it less susceptible to temperature changes from possible varying plant temperatures and, in addition, it, of course, conserves floor space. The oven temperature is maintained at 325° F. automatically. The parts are in the bake oven approximately 10 minutes.

Waxed paper "sleeves" protect finished parts

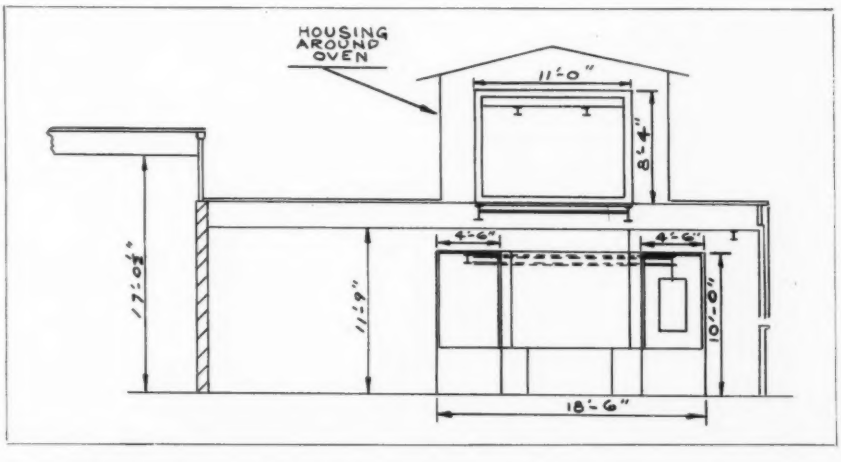
Following baking, the parts return to floor level to an unloading area where operators "sleeve" or cover the painted sections with prefabricated protective paper sections. The paper is coated with a wax finish to minimize abrasion.

All "sleeved" tubular parts are transferred only a few feet to the packaging line where they are packed in corrugated containers with the liberal use of interior packaging for shock absorption.

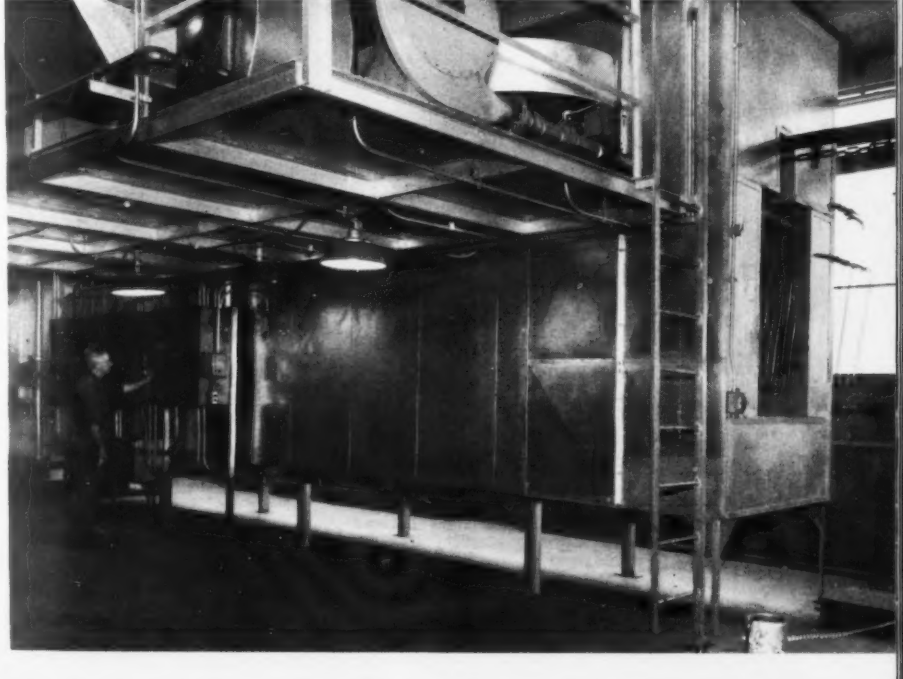
It was my intention to mention the fact that the facilities of the finishing plant are entirely for contract production of furniture parts, except for a new line of school furniture which is produced by our third affiliate, School Furniture Manufacturing Company. This latter company was organized to manufacture and promote the sale of a new type of functional school furniture, the basic components of which are tubular frames and glass fiber impregnated plastic seats and desk tops. All of the school furniture was designed by William Bargen, who has spent a lifetime in school furniture design. Designs are

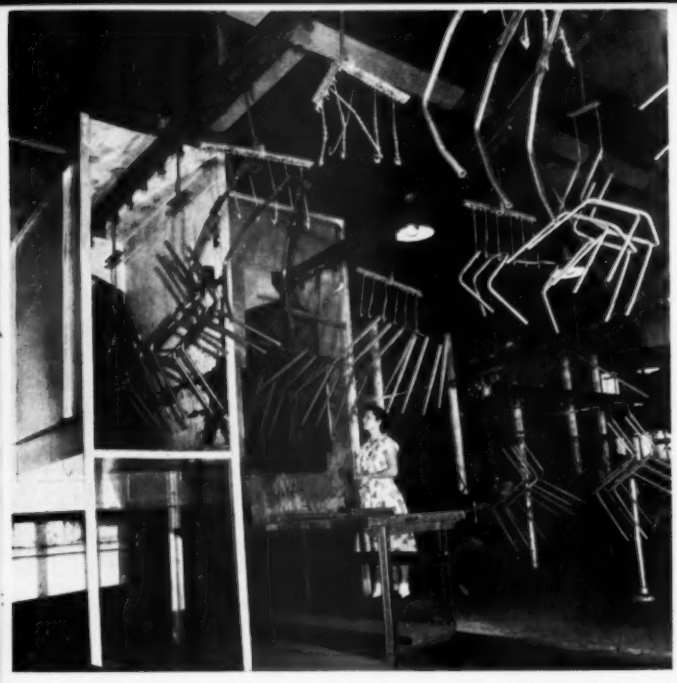


Loading tubular metal furniture parts on a section of conveyor which immediately precedes entrance into cleaning and phosphatizing section of the metal finishing system.



This is the dry-off oven which follows metal preparation. Operator is shown at control panel for this equipment. The exit end for the dry-off oven is shown at right. Note the overhead location of blowers and other equipment to conserve space.





In this photo can be seen both the entrance (left) and the exit openings of the flow coating machine. Operator is spot checking by visual inspection as parts leave the machine.

Tubular metal chair parts (right) are entering the ceiling level baking oven following the flow application of paint. Descending conveyor at left feeds the inspection and packaging department.

Hourly checks are made on the paint. The material is set up at 17 seconds at 95° F. on a Zahn #2 cup.

Operator is placing waxed paper "sleeves" over tubular parts for finish protection.

based on posturepedic research, and the requirements for strictly functional furniture for classrooms.

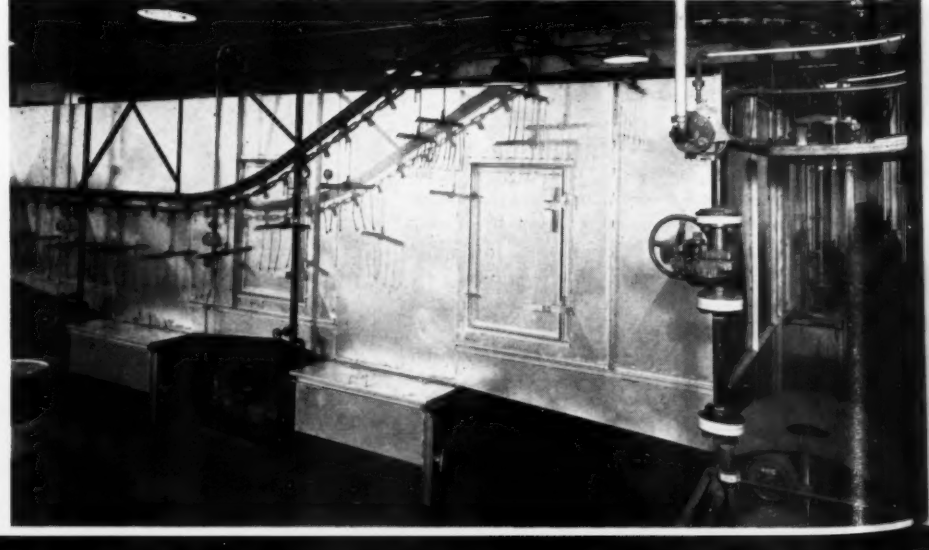
Thirty million feet of tubing per year

It may be of interest to note that we process over 30,000,000 feet of tubing a year. Our tubing stock is normally 1,500,000 to 2,000,000 feet of 1 inch and ¾-inch diameters.

The finishing system, as described, is built to handle 30,000 parts a day on two shifts. We are currently running one shift, and are finishing approximately 16,000 to 18,000 pieces per day. New hangers are being designed for chair frames which will handle three frames on a single hanger. This will, in turn, increase our daily unit production figures.

As can be seen, the finishing system is set up as a specialized unit to do the specific type of work in which we are interested. We feel that for anyone that is in position to confine their finishing operations to a specialized class of work such as in our plant, it is now possible to design a highly-satisfactory, completely conveyorized system in a very small area of floor space.

Two access doors to flow coat machine are visible in this photograph, as well as two of the materials tanks serving two of three separate circulating systems. Provision is made for quick changeover to any of three separate colors used.



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Leonard Raulston, IAM President, "25 Years of Progress."

Right: T. Spencer Shore, "Be optimistic, but loaded with cash."

Institute of Appliance Manufacturers

TWENTY-FIFTH ANNIVERSARY MEETING

IN opening the 25th Anniversary Meeting of the Institute of Appliance Manufacturers, Leonard Raulston, Institute president, and general manager, United States Stove Company, South Pittsburgh, Tennessee, briefly outlined the history of the group and gave credit to the founders.

Bolling Jones, Jr., President of Atlanta Stove Works, Inc. and Birmingham Stove and Range Company, and Millard H. Pryor, President of Barnes Manufacturing Company, were credited with organizing the exploratory meetings which resulted in the formation of the Institute of Cooking and Heating Appliance Manufacturers, a name which was later changed to the Institute of Appliance Manufacturers.

Reference is also made to the "second oldest trade association in America", the National Association of Stove Manufacturers, which preceded the founding of the new organization by Jones and Pryor, officers of the then inactive original association, were credited with assisting in the development of the new organization.

Thirteen guide points

T. Spencer Shore, president, Eagle-Picher Company, Cincinnati, presented one of the most interesting discussions on the organization and operation of a manufacturing business that it has been our privilege to hear.

In addition to being president of Eagle-Picher, a position which he has held since January 1949, Mr. Shore is a member of the board of directors of the Central Trust Company of Cincinnati, Cincinnati Gas & Electric Company, Cluett, Peabody & Company, Inc. (Arrow Shirts), Federated Department Stores, Inc., and The Kroger Company.

The speaker used his own company as an example of how a "100 year old organization" can and should be prepared financially and organization-wise to diversify. Only a few of his many pertinent comments can be included in this brief report. In referring to the liquidation of non-profitable plants or subsidiaries, he stressed the fact that a company should "build first and then liquidate." In referring to expanded company activities, he said, "You can expand in any field as long as it is within the talents of the organization." He stated that in studying his company it was found that 95 per cent of the business of Eagle-Picher Company was for manufacturers. "We were a manufacturers' manufacturer", Mr. Shore pointed out.

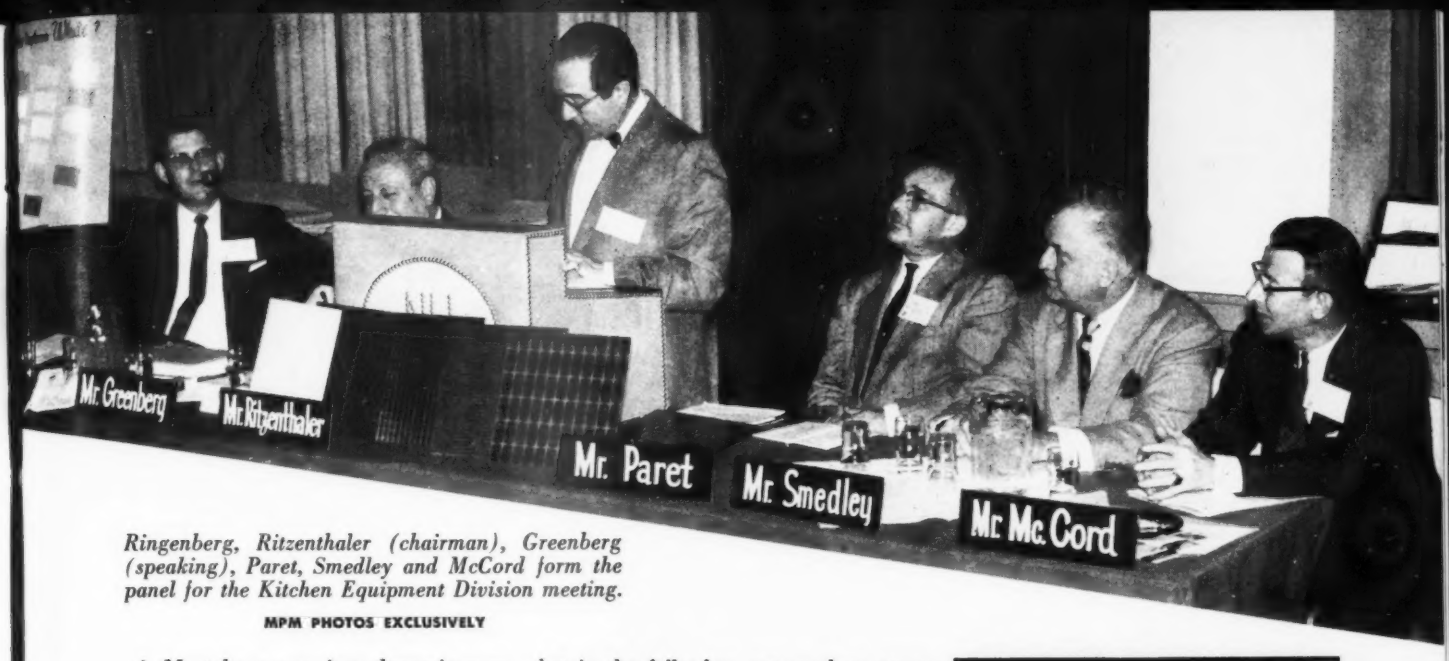
Included in the speaker's description of company changes was the selling of seven plants within seven months — completing the liquidation stage. The company then set out to purchase profitable growing concerns in diversified industries. The company policy was to purchase only those concerns having a capable organization to continue the operations.

Mr. Shore presented thirteen points as a guide to a successful publicly owned business. They are as follows:

1. Satisfactory earnings in dollars
2. The profit motive must be sold to the organization
3. Profit and loss statements should be made available to the organization

Stanley E. Fowler, Geo. D. Roper Corp., presents plan for service and sales training.

Lewis W. Selmeier, advertising agency executive, gives his illustrated presentation on "Progress in Home Appliances — 1932-1957."



Ringenberg, Ritzenthaler (chairman), Greenberg (speaking), Paret, Smedley and McCord form the panel for the Kitchen Equipment Division meeting.

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4. Must be a growing, dynamic company
5. Recognition that "man power in business is everything"
6. Develop an "upper third of the class" organization
7. Get the facts (before making a move)
8. A basic, real, and progressive philosophy of responsibility for employees, stockholders and customers
9. A long range plan
10. Day to day results are important but the "long term" must be built solidly.
11. Top management must set the pace
12. *Be optimistic, but loaded with cash* (Many more companies go broke than plants burn down.)
13. The company must be a good "citizen" in its community.

Capacity and demand

Tom Campbell, Editor-in-Chief of The Iron Age, told the IAM Membership that he predicted a better availability of sheet and strip steel, higher steel prices in July, and a little tighter market in the fall when auto makers come into the market in a much bigger way. "It would be folly," he warned, "to let steel and other metal stocks get to a hand to mouth basis when everyone has the same idea." "That could only mean," he said, "that a supply squeeze could come later, a squeeze that is absolutely unnecessary if the manufacturer is willing to carry reasonable stocks."

Campbell suggested that while the appliance industry now has enough capacity to out-produce current demand, there is a logical answer in: a better sales pitch tuned to motivation; harder selling; better prospect lists; pooling of design and market research by smaller firms; small firms getting the jump on some of the "bigger" companies by more personal selling; investigation and study of a "real" trade-in plan — and doing a better job of studying the homemaker.

Some appliance makers don't really know how good their product is or how to sell it. Nor do they always attempt to "awaken" their dealers, Campbell said.

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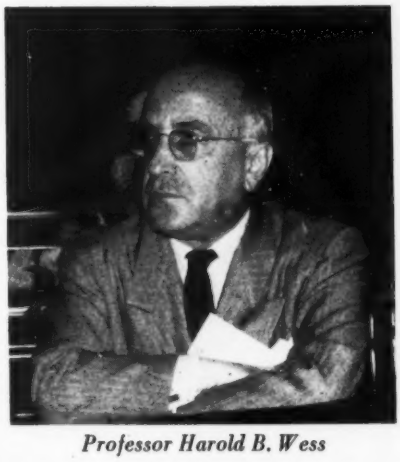


Professor Harold B. Wess

Sam and Pauline Dunckel receive plaque commemorating 25 years of service from F. H. Guthrie, president, Newark Stove (at microphone) and IAM *president Raulston.*

R. J. Shepherd, vice president-sales, Cribben & Sexton Co., was General Session chairman for Tuesday's meeting.

W. H. Gibbons, advertising manager of Tinnerman Products, Inc., Cleveland, accepts first prize for "color advertising" from IAM *President Raulston. First prize for black and white advertising went to Verson Allsteel Press Co.*

Martin Stamping and Stove Co. was well represented at the convention by, left to right: F. N. Sefton, vp; W. H. Martin, Jr., president; F. H. Martin, vp; and A. R. Tomlinson, secretary.

Display booth of Associated Spring Corp., Bristol, Conn., won first prize in exhibit contest sponsored by IAM.

Honorable mention in the IAM *Convention Exhibit Contest went to George A. Tinnerman Corp. (Photo at left) and Robertshaw-Fulton Controls Co.*

MPM PHOTOS

25 years of appliance progress

On Tuesday, Lewis W. Selmeier of the Lewis W. Selmeier Advertising Agency constrasted the appliances of 25 and 30 years ago with today's models and the "dream models" projected for the future by appliance and kitchen product manufacturers. His illustrated presentation was a highlight in the Tuesday program.

Harold B. Wess, Professor of Business Administration and Marketing, The American University, hurled a warning at the manufacturers in a speech entitled *"What is Past is Prologue."*

Said Mr. Wess, "If the major trends in our country of the last twenty-five years are not reversed, we will end up in the same plight as Great Britain and France now find themselves — or perhaps in an even worse condition."

In referring to the effect of labor unions on our economy he said "Feather-bedding and restrictive practices by labor unions sap the great productive power of our country and will continue to do so unless this trend is reversed."

"Unless labor statesmanship reverses its present type of leadership — which still behaves as if we were living in the depressed 30's instead of the prosperous '50's, the present trend of giving less and less work for more and more money will so reduce our productive power that we will achieve full employment in a decaying economy . . . " Mr. Wess stated.

In speaking more specifically of the problems of appliance manufacturers, Mr. Wess said "Color will not revolutionize the industry" — "Until your trade-in merchandise is better organized and used to make money, you will not be in position to get the greatest benefit from a growing market." "Trade-ins," he said, "must be resold at a profit."

In speaking of small business, Mr. Wess said "When small business disappears, free enterprise will disappear."

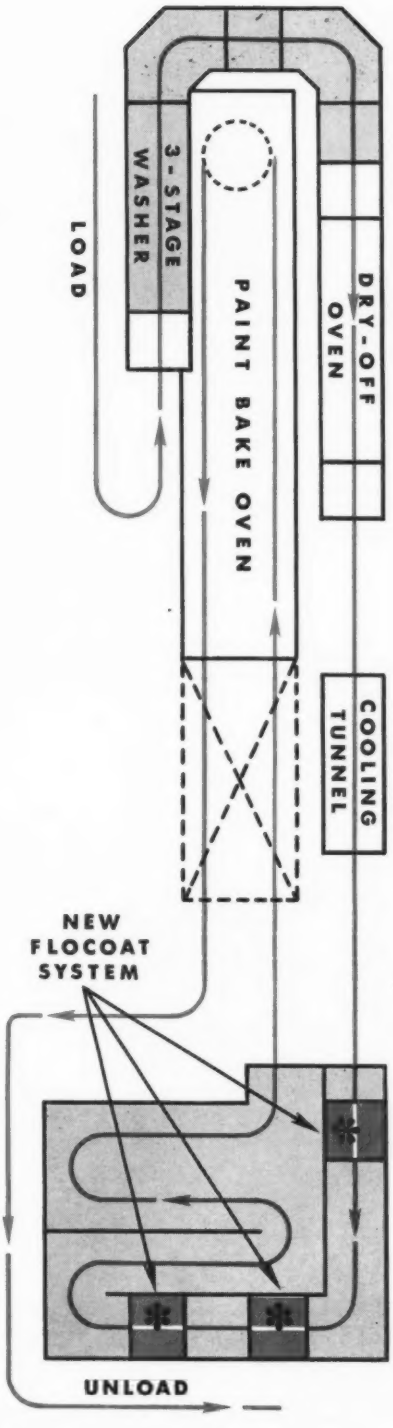
Minimum Service Charge

Stanley E. Fowler, Geo. D. Roper Corporation, did a clear cut job of presenting a recommended method for training men for service and sales.

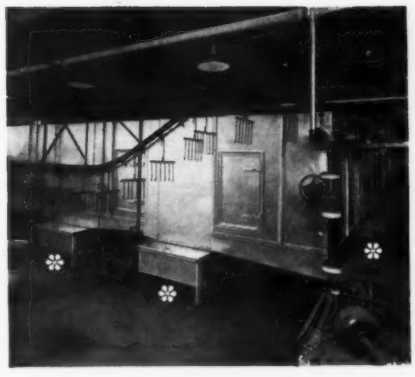
In his presentation, Mr. Fowler spoke for a minimum service charge for appliance service. "Free service, he said, cheapens the viewpoint of the product."

In outlining the method used by Roper for getting information to the proper people along the merchandising

to Page 60 →



NEW 3 Color Flocoat System with 5 Minute Color Change



This system was specially engineered by Burdett Engineers to provide automation in multi-color paint applications in the plant of the Douglas-Fisher Corporation in Bellwood, Illinois, manufacturers of tubular metal furniture.

This complete finishing system by Burdett features a new concept in Flocoating with a 3-color system that provides color change in approximately five minutes.

This system consists of 750 feet of No. 348 conveyor, variable from 4 to 12 FPM; a 3-stage washer; a 25' dry-off oven heated by Burdett No. 10-L Burners, providing a heat range from 200° to 450° F.; a 15' cooling tunnel; a Burdett 3-color Flocoating System; and a Burdett 2-Pass "A" Type "Radiant Heat" Paint Baking Oven with a range from 200° to 425° F. Operating at 325° F. on current production, the total baking cycle is approximately 8 minutes.

Here is a perfect example of the engineering skill and production "know-how" that Burdett offers you to open the door to improved quality of production—increased output—and lower cost of operating.

Whether you are considering a completely new finishing system—an addition to your present layout—or, the renovating of your old system—consult Burdett for the engineering answer with the bonus values—either "Radiant" or "Convection".

Request complete information without delay!

SEE OUR CATALOG IN SWEET'S PLANT ENGINEERING FILE OR WRITE FOR COPY

BURDETT
MANUFACTURING COMPANY
4918 South Monitor Avenue, Chicago 38, Illinois
DETROIT PHILADELPHIA NEW YORK CLEVELAND DALLAS
Manufacturers of
COMPLETE FINISHING SYSTEMS — "RADIANT-HEAT" SYSTEMS, OVENS, HEATERS
AIR MAKE-UP UNITS, SPRAY BOOTHS AND WASHERS

1st fairway, Homestead golf course, Hot Springs, Virginia. **MPM PHOTO**

R. H. Jones, General Electric; Don Wood, Bendix-Westinghouse; John

The refrigeration and air conditioning industry go

K. B. Crowell, Carrier; Sidney Anderson, Airtemp; E. R. Michel, Worthington; and Jim Tweedell, Carrier.

W. C. Egan, J. R. Voight, Lars C. Hanson, and Russell Gray, all of Carrier.

W. J. Osborne, Keeny Publ. Co.; M. M. Lawler, Worthington; Mark Mooney, Typhoon; and D. C. McSorley, Du Pont.

A. W. Snyder, Hussman; Al Schildhammer, Business News Publ. Co.; E. F. Burow, Owens-Corning; R. A. Line, Hussman.

W. G. Kronauge, Kelvinator; Duke Hildreth, Westinghouse; Ted Nemes, Cory; and Bud Lonergan, McGraw-Edison.

W. R. Eichelberger, Acme Industries; R. B. Stotz, Airtemp; John E. Dube, Alco Valve; and R. M. Locke, Minn.-Honeywell.

H. C. Hahn, McGraw-Hill; A. Rising, York; L. M. Larkin, Whirlpool; and Fred Kaths, A. O. Sutton.

STEPHEN BLAKE PHOTO

Morrill, Bendix-Westinghouse; and C. B. Ramsdell, General Electric.

MPM PHOTO

Karl W. Schick, Minneapolis-Honeywell, and A. F. Ward, Worthington.

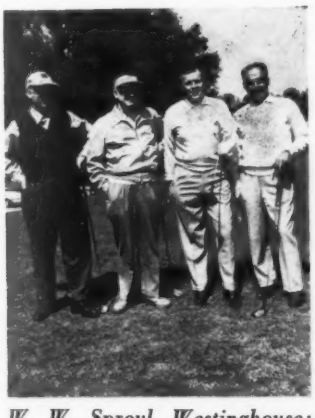
MPM PHOTO

Gerry Powell, assistant sales manager, and R. A. Sherer, sales manager, both of White-Rogers.

goes golfing

a complete editor's report on the ARI fourth annual meeting appeared in the June issue of MPM, starting on page thirty

V. C. Petchul, Watson Publ.; Don Cousins, Marley Co.; R. J. Powell, Marley Co.; and Tom Morrison, Paragon Electric.



W. W. Sproul, Westinghouse; Larry Wray, McGraw-Hill; J. H. Pratt, ARI (counsel) and A. J. DeFino, Servel.

C. H. Benson, Imperial Brass; R. A. Gray, Jr., Mueller Brass; J. D. Bopp, Ansul Chem.; R. H. Herrmann, Davidson Chem.

William Moll, Whirlpool; J. W. Hosler, American Blower; J. J. Ammel, Kelvinator; and J. H. Bergheim, ARI.

R. K. Serfass, York; W. H. Aubrey, Frick Co.; Elbridge Gammill, Carrier; and W. B. Cott, Westinghouse.

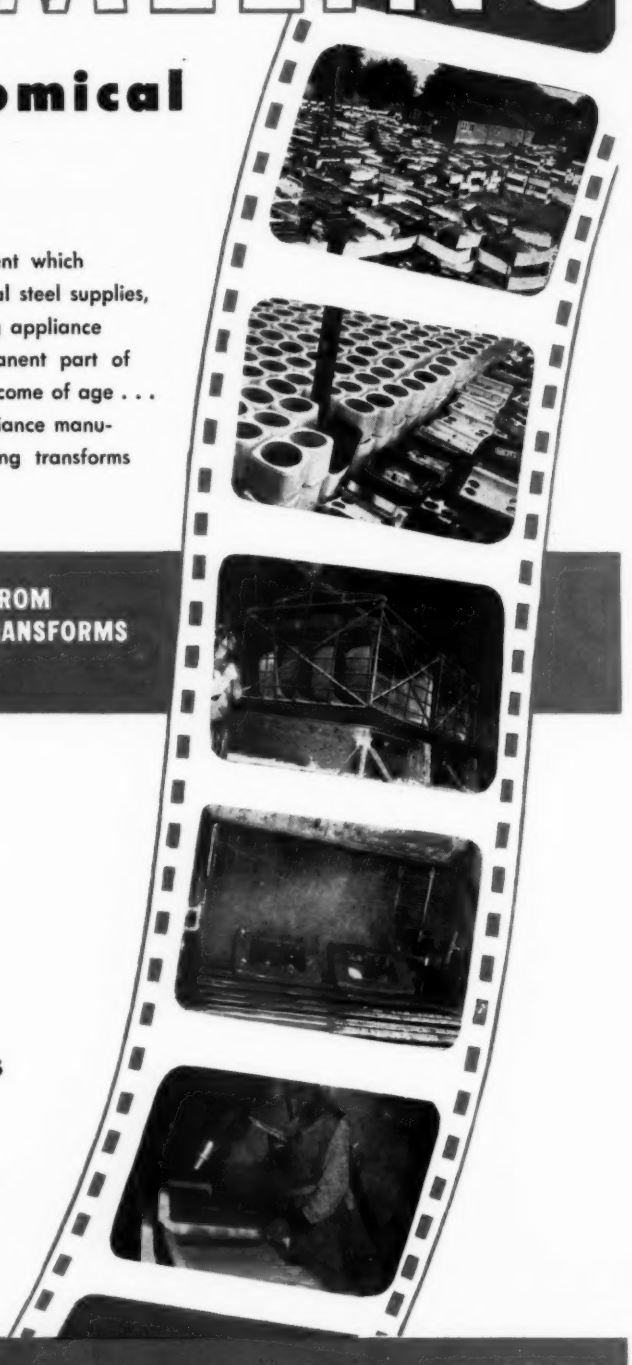
R. W. Jones, Ed Friedrich; B. C. Brown, National U. S. Radiator; R. G. Berg, Copeland; and Ken Cash, Penn Controls.

E. B. Dunphy, Acme Industries; C. T. Lawson, Kelvinator; H. G. Strong, RISAC; and P. A. Weatherwax, Acme Industries.

D-ENAMELING

is more economical than ever . . .

Once D-Enameling was a temporary expedient which appliance manufacturers used to stretch critical steel supplies, but that day is gone! Now, America's leading appliance manufacturers consider D-Enameling a permanent part of their manufacturing picture. D-Enameling has come of age . . . has assumed its role as a routine step in appliance manufacturing. The reason is simple — D-Enameling transforms scrap loss into profit dollars.



THESE INDUSTRY LEADERS KNOW FROM EXPERIENCE THAT D-ENAMELING TRANSFORMS SCRAP LOSS INTO PROFIT DOLLARS

AIRLINES

HOME LAUNDRY APPLIANCE MANUFACTURERS

JOB ENAMELING PLANTS

RANGE MANUFACTURERS

REFRIGERATOR MANUFACTURERS

SANITARY WARE MANUFACTURERS

SIGN MANUFACTURERS

SPACE HEATER MANUFACTURERS

WATER HEATER MANUFACTURERS

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Highland and New Haven Avenues • Aurora, Illinois

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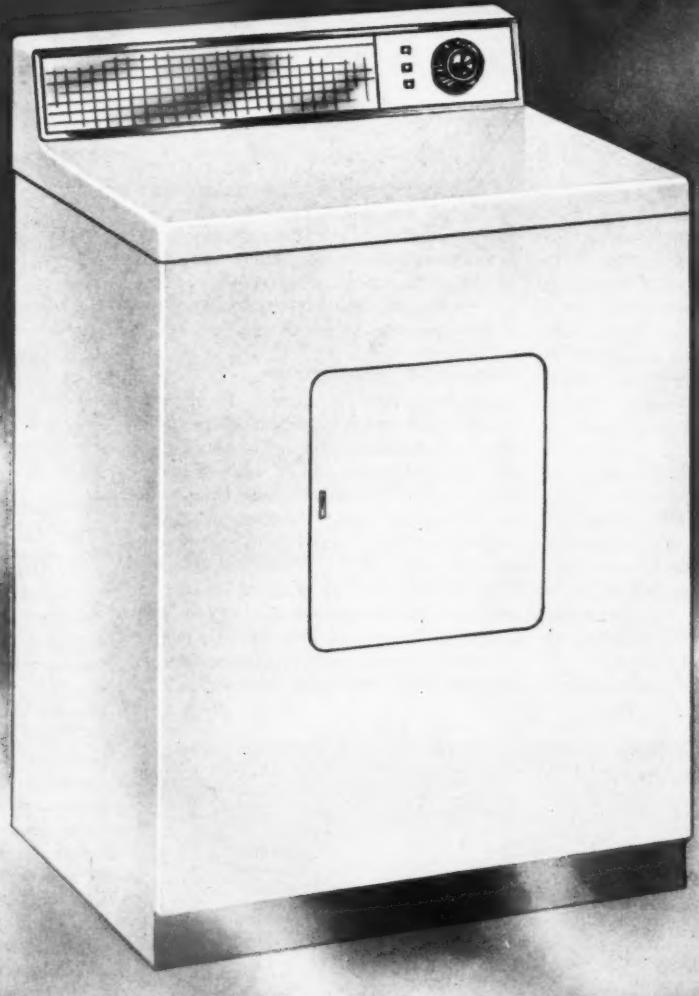
a steam vapor and alkali resisting ground coat

that you can DIP



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A report on

The eighth annual appliance technical conference

trend to greater automation in appliances advances interest in engineering problems —

WITH each succeeding annual Appliance Technical Conference there is indication of greater interest among the industry's technically trained men. The number of men in attendance from individual manufacturing companies would indicate also that top management approves of this method of educational interchange of ideas and engineering information.

The eighth annual conference held in the unusually fine facilities of the Rackham Building in Detroit, Monday and Tuesday, May 20 and 21, offered a solid two day program of technical and practical information for appliance engineers and the engineers of companies building major components. Under the sponsorship of the Subcommittee on Domestic Appliances of the AIEE Committee on Domestic and Commercial Applications, in cooperation with the Michigan Section of AIEE, the conference enjoyed excellent attendance in an atmosphere conducive to success.

Conference Organization

Among those responsible for the organization, programming, and operation of the conference were: H. F. Hoebel, American Gas and Electric Corp., and chairman, AIEE Committee on Domestic and Commercial Applications, who presided at the opening session; and D. C. Krammes, Hoover Co., chairman of subcommittee on Domestic Appliances who served as program chairman for the conference.

Local operating arrangements were handled by General Chairman W. R. Milby, Detroit Edison, supported by others from his company and H. M. Hess of Wayne State University.

Following Mr. Hoebel as chairman of the first session were three men who have been active in conference work, each responsible for a one half day session. These men were T. H. Cline, Newark Stove Company, G. E. Schall, Underwriters Laboratories and B. F. Parr, Westinghouse Electric Corp.

The big challenge

E. O. George, V.P., Detroit Edison, speaking for the electrical interests of the appliance industry referred to "The big challenge of the (electrical) appliance industry as the challenge of living up to the responsibilities of the all electric home.

"We have a lion by the tail", he said, "because we have encouraged the trend towards all-electric living. We have sponsored the dependence our customers now place on our products and our service. Having done so, it automatically becomes our responsibility to justify this dependence by providing customers, insofar as humanly possible, with continuous use of their appliances."

"It is almost an axiom" he continued, "that *consumer convenience* and *service* are inversely related — that as appli-

SESSION I (left to right) W. R. Milby, Detroit Edison; D. C. Krammes, Hoover Co.; D. L. Winsor, Raytheon; H. F. Hoebel, Am. Gas & Elec. Service; D. V. Newton, IBM; B. F. Parr, Westinghouse.

CONFERENCE LUNCHEON is shown in sectional photos by MPM photographer.

by Dana Chase • EDITOR

conference scope to be broadened

ances become more automatic, more convenient for the home owner to use, they also become more complex mechanically. This increased complexity means greater service problems. . . appliance service — good appliance service — is today more than just a nice thing to have. To the consumer it is a stark necessity. . ."

In considering specific service problems Mr. George referred to "service design", a responsibility of the design engineer. A good job has been done, he said, in designing appliances that have a great deal of sales and eye appeal. An equally good job of improving product performance has been done. But, he said, in so doing, the question of *service accessibility* has apparently sometimes been overlooked.

Examples: A simple belt replacement requires, on a specific major appliance, almost a complete disassembly — time required forty-five minutes; to adjust an automatic unit thermo control on a range, a serviceman must tear down the entire top portion of the range — time one hour; a new 1957 steam iron requires a complete tear down to adjust the thermostat.

George made no effort to minimize the engineering difficulties involved in producing service accessibility but he outlined three requirements":

1. design of eye appeal or sales appeal
2. design for performance
3. design so that parts are accessible to the serviceman and so that repairs are as simple as possible.

Built-ins, he declared, have stimulated the appliance market but, from a service point of view, they are "desperately in need of attention". Few can be serviced from the front and if something goes wrong the serviceman must "unbuild" the built-in to repair it.

George contrasted the home of 1930 with its average of eleven electric appliances with today's average home which has as many as 50 or 60 appliances and then pointed to the necessity for 1) Reliable and continuous utility service, 2) dependably engineered and built appliances, and 3) available and dependable product service at the consumer level.

Digital Computors and Micro-Wave Ovens

The Monday morning session contained two papers covering today's "mechanical and/or electrical wonders".

The Digital Computor was described and the solution of typical problems discussed by D. V. Newton, International Business Machines Corp. Their application for quality control, production control, sales forecasting etc., were touched on in addition to engineering problem application.

The computor has an excellent memory. One model can transmit to and from the "arithmetic section" at the rate of 42,000 ten—digit number per second.

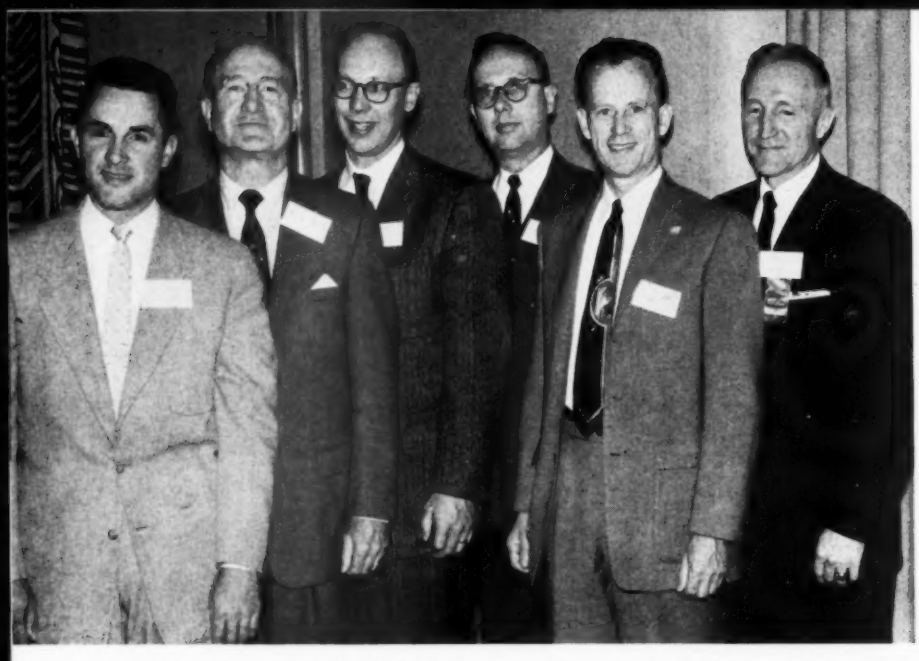
The solution of a set of linear simultaneous equations requiring two days of an average engineer's time, required five hours of a digital computer's time in 1949, two hours in 1952. Now it takes one model a little over one minute and another model less than one second for the same task.

Newton stressed the fact that the computer, while valuable as an engineering tool, does not eliminate the need for human brain power. "Only *properly planned* projects," he said, "can use its power.

"The Electronics of Domestic Microwave Ovens" was the subject title of a paper by D. L. Winsor, Raytheon Manufacturing Co.

Microwave cooking is made readily

SESSION II (left to right) Vincent B. Krenke, Bryant Electric; Victor Weber, Robertshaw-Fulton; T. H. Cline, Newark Stove; E. E. Sivacek, King-Seeley; S. C. Jordan, G. E.



SESSION III (left to right) A. B. Marmo, Westinghouse; W. Parkerson, Middle West Service; M. A. Fuller, Whirlpool; G. E. Schall, Underwriters Labs; R. H. Gardner, The Hoover Co.; W. R. Milby, Gen. Chm. AIEE — *DCA Committee.*

MPM photo

possible, Winsor said, by the high water content of the foods.

The ability to design and mass produce reliable high power microwave generators made the development of the microwave heating equipment possible, he said.

Components and technical characteristics were illustrated and described for an oven that Winsor said will heat a wide variety of foods of varying weight and geometry satisfactorily.

Range top unit thermostat controls

The Monday afternoon session was devoted entirely to the subject of surface unit thermostat controls and their application. A panel of four engineers covered the subject with extreme thoroughness. They were: S. C. Jordan, General Electric; E. E. Sivacek, King Seeley; Victor Weber, Robertshaw-Fulton Controls; and Vincent Krenke, Bryant Electric.

There was a consensus of opinion that automatic surface unit cooking has now had sufficient time in the field to prove its effectiveness.

Sivacek credited temperature controlled small appliances with having speeded up the demand for the control of surface units on ranges. In the case of King Seeley, company engineers drew on their experience in connection with automotive gauging devices in the development of their appliance control.

(While details of the complete technical reports cannot be included in this news report more detailed information may be expected in later issues as a follow up of earlier articles on this subject).

There seemed to be general agreement on some points of design for the surface control devices. Control of "overshoot" is necessary for a satisfactory unit; thermal mass should be small in relation to the heating surface; the uncontrollable element of variations in utensils used is extremely important to the designing engineer; and a certain amount of judgment is still needed on the part of the lady of the house for full benefit of automatic operation.

Victor Weber pointed out that cooking on a surface unit is much more complex than cooking in an oven due to the facts that the temperature range is wider, the number of different foods is greater and only the bottom of the cooking vessel is exposed to the heat.

Mr. Weber illustrated the variations resulting from vessels of different materials and different weights and thicknesses and gave data to show the wide difference in results from cooking in open and covered vessels.

Example of required wattages

Covered pan light boil — 180 watts
Covered pan heavy boil — 580 watts
Uncovered pan light boil — 830 watts
Uncovered pan heavy boil — 1400 watts

Portable appliance safety

"Safety in the design of portable appliances" was the theme of a paper by R. H. Gardner, The Hoover Company, presented as the opener on the Tuesday morning session.

Both electrical safety and mechanical safety factors were covered.

Appliances cannot be designed to protect the careless user, said Gardner, but obviously potentially hazardous arrangements *can* be avoided through careful design.

Handles, switches, cords, sharp edges and many other design features — all must be considered in the light of safety for the user.

Proper selection of materials and arrangement of parts were covered in this illustrated paper on the subject of safety.

Utility, manufacturer cooperative relationship

M. A. Fuller of Whirlpool Corp., delivered a paper by Fuller and W. Parkerson, Middle West Service Co., in which he described cooperative programs entered into with utilities in relation to load saturation, minimum and maximum requirements, etc.

He expressed the belief that utilities and appliance manufacturers *must* work together in the realization that the public represents a common customer for both.

W. R. Milby, Detroit Edison, pre-

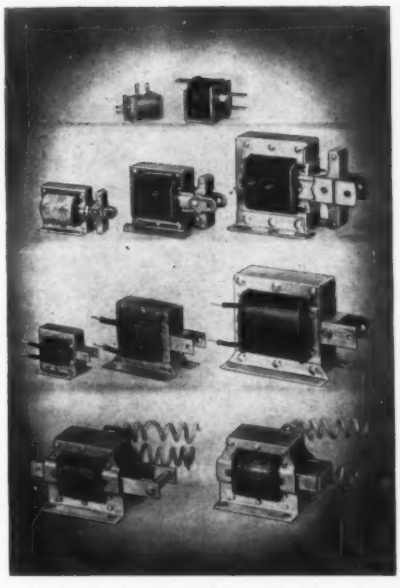
to Page 90 →

SESSION IV (left to right) D. O. Myers, Controls Corp. of America; A. R. Constantine, Consultant to Kingston Products Corp.; D. J. Schmitt, Therm-O-Disc; B. F. Parr, Chairman Session Four; M. F. Metzger, G. E.; A. M. Stone, G. E.

MPM photo

NEW Supplies and Equipment

CUSTOM-DESIGNED SOLENOIDS



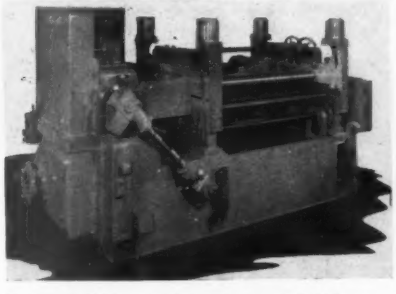
A line of solenoids consisting of 17 models to provide 34 widely differing specifications is available. Included are pull and/or push capacities ranging up to 45 lbs., in sizes from 1⅜" to 3" x 3", and with stroke lengths fractional to 2". According to the manufacturer, the solenoids are built to rigid standards, and double shading coils provide high sealed pull without hammer or excessive ac. hum. Dept. MPM, Dormeyer Industries, Dept. FEC, 3418 N. Milwaukee Ave., Chicago 14, Ill.

NEW, LOW COST TERMINAL BLOCKS

Molded of low cost, UL-approved plastic, "Molex" terminal blocks feature low moisture absorption, excellent dimensional stability, and good dielectric strength, according to the manufacturer. The disconnect terminal blocks are available in infinite sizes, shapes, and terminal arrangements to meet custom multiple- circuit requirements. The molded blocks permit more compact, simplified installations with barriers which eliminate terminal turning, and give greater over-surface distance against current leakage. All models accept standard female terminal connectors. Dept. MPM, Molex Products Co., 9515 Southview Ave., Brookfield, Ill.

PRESS FEEDER FOR STOCK UP TO .125 INCH THICKNESS

A mechanically-controlled, completely automatic feed line for either blanking or progressive die presses has been developed which will feed lengths as long as 60" of .125" by 60"-wide stock. Composed of a coil holder, a decoiling unit, a mechanically-controlled feeder unit, and, in cases where a scrap skeleton must be disposed of, a scrap shear, the line is applicable without modification to both progressive die operations and straight blanking work, and is electrically synchronized with the press. Dept. MPM, McKay Machine Co., Youngstown 1, Ohio.



TITANIUM ANODIZING RACK

An all-titanium anodizing rack, with a reportedly-high degree of adjustability to adapt it to different types of anodizing jobs, is now available. The racks are made of titanium "Z" sections spot welded to a titanium base section to provide a series of grooves. In these grooves, titanium "fingers," which act as contact points, can be moved and fixed in any position. The design makes the racks suitable for use in anodizing parts of widely-varying shape and size. The use of titanium provides a rack that is not appreciably attacked by most of the chemical solutions encountered in anodizing. Dept. MPM, Robe, Inc., P. O. Box 206, Springfield, Va.

BETTER ADHESION FOR PLASTICS TO METALS

A cement for bonding semi-rigid vinyl to a wide range of metal and other materials, and a primer for improving bonds between plastisols and organosols to metals, has been developed. The cement may be applied to the metal by roller coat, spray, brush, or dip, and the resulting laminate can be deep drawn, punched, cut, drilled, or crimped with no separation of the plies. The primer can be applied with conventional methods, with a pre-bake of the primer, or with only normal drying before coating with plastisol. Dept. MPM, Compo Chemical Co., Dept. NS, 125 Roberts Rd., Waltham 54, Mass.

DRY-TYPE TORCH FOR OPERATION UP TO 800 AMPERES

A dry-type torch, designed for automatic welding in a carbon dioxide atmosphere, has been announced. Known as "Fillerarc," the unit is interchangeable with the standard water-cooled version in its attachment to an automatic wire feeder, and is rated for operation up to 800 amperes. Its inverted pyramid tip design deflects spatter, and reduces the possibility of spatter buildup, according to the manufacturers. Dept. MPM, General Electric, Schenectady 5, N. Y.

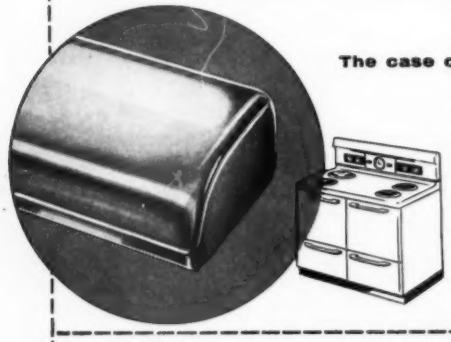
ULTRASONIC CLEANING MACHINE

A line of seven standard ultrasonic cleaning machines, equipped to meet industry's exacting needs, has been introduced. Removal of buffing and polishing compounds, honing and abrasive materials, machining chips, and non-soluble deposits is now practical and rapid with the equipment, according to the manufacturer. It is claimed that blind holes and inaccessible recesses no longer must be hand scavenged and wiped clean, and that work can be spotlessly cleaned with resultant saving in labor cost. Dept. MPM, Circo Equipment Co., 121 Central Ave., Rahway, N. J.

Actual case histories of unusual design problems solved by Pyramid Mouldings

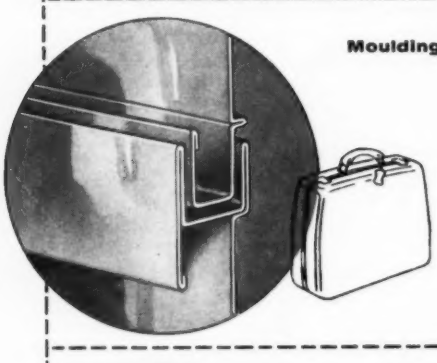
Pyramid Mouldings

Design Clinic



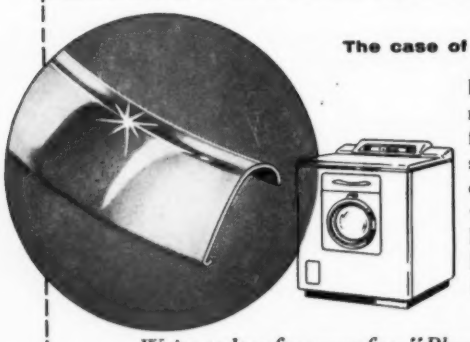
The case of the range lamp...

following the trend to longer lines has been ideally answered with rolled mouldings. Made to any desired length without change in tooling, ends are often formed as shown to eliminate costly end caps.



Mouldings made "case" history...

in one of America's leading luggage lines by adding the finishing touch to smart styling with these intricately formed bezels. Rolled to shape and bent to exact case contour, they covered raw edges, added structural strength, provided dustproof construction.



The case of the missing "drop-out"...

has meant money to the many manufacturers who have found that mouldings rolled in spirals and cut in circles eliminates waste unavoidable with stamped parts. Bezels, burner rings or *any* ring or bezel can be economically roll formed by Pyramid.

Write today for your free "Plan Book of Metal Mouldings"

Pyramid Mouldings Inc.

5365 WEST ARMSTRONG AVE., CHICAGO 30, ILL.
NEW YORK...CALIFORNIA

I A M → *from Page 50*

and service line, it was pointed out that an individual manual is prepared for each type of appliance, plus a parts list, plus a care and operation booklet.*

Mr. Fowler suggested that in the small dealer's store every employee should, from office man to delivery boy, be made a salesman — with a bonus for a sale.

*See "Roper puts the accent on customer service . . . " May 1956 MPM, Page 58.

Kitchen equipment division meeting

As was the case in the last IAM Convention, the meeting of the Kitchen Equipment Division was jam packed with those interested in the reports and discussion by an expert panel consisting of: Ronald Ringenberg, Assistant Sales Manager, Mutschler Brothers Company; A. A. Greenberg, Business Manager, *National Furniture Review;* Richard E. Paret, Stainless Steel Specialist, American Iron and Steel Institute; John R. McCord, Director of Public Relations, Ferro Corporation; and Carl R. Smedley, Director, Color Research, The Glidden Company.

Close attention was given to the words of Mr. Greenberg who presented a strong case for the furniture dealer in the retail sales picture for appliances.

Mr. Paret used slides to show suggested methods for the use of stainless steel in coordinating individual kitchen appliances produced by different manufacturers.

With Ronald Ringenberg to discuss the coordination of appliances and cabinets and with the representatives of Glidden and Ferro to discuss the current situation with regard to color in appliances, this session proved to be one of the most interesting held during the convention.

Mr. Smedley of Glidden again presented the "neutral gray" and the "neutral yellow" as a starter for color standardization. "Color definitely will stay" he said "even though there are some bugs to be ironed out."

"Color has motivated consumer buying habits in other fields of merchandise" said McCord, and he raised a question as to whether the industry may have missed the boat in not having a truly representative line at the dealer level. "Have we been selling too much automaticity and labor-saving in appliances"? McCord asked. "Color could be the selling point for increased appliance sales", he said. "Color at no extra cost may add the necessary selling power." *(the next* IAM *meeting is scheduled for the Shoreham, Washington, D.C.)*

For Increased Production, Lowered Costs . . .

SPECIFY YOUNGSTOWN SHEETS AND STRIP

Batteries of modern forming presses are busy working around-the-clock to keep today's auto body production in high gear. In order to maintain their reputations for high product quality, leading producers specify Youngstown Sheets and Strip because they're a blend of the proper combination of tensile strength, surface finish, flatness and ductility. Our satisfied customers tell us they get:

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- Lowered Reject Rates
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- Decreased Fabrication and Die Costs

Why not make Youngstown your sheet and strip specification for improved product quality—and lowered production costs?

Youngstown Sheets and Strip are known throughout the stamping and drawing industry for their uniform high quality. Rigid quality control over every phase of their production provides a steel to meet **your** exact specifications. Since Youngstown's best—why settle for less?

For additional information or metallurgical field assistance, call or write your nearest Youngstown District Sales Office—or write directly to our Home Office.

Photo Courtesy of General Motors Corp.

COLD ROLLED SHEETS

QUALITY YOUNGSTOWN SERVICE

AND STRIP

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices - Youngstown 1, Ohio

District Sales Offices in Principal Cities

LOW COST, SCALE-FREE PHOSPHATIZING

This manufacturer offers literature on their product called "Divobond." One-half pound of this phosphate material in solution is said to cover 1,000 square feet of work. For complete information write Dept. MPM, Metal Industries Department, The Diversey Corp., 1820 Roscoe St., Chicago 13, Ill.

HIGH DENSITY MILL LININGS

For complete information on a line of high density mill linings and grinding balls, write for bulletin B1-56. Dept. MPM., McDanel Refractory Porcelain Co., Beaver Falls, Pa.

COMPLETE LINE OF CONTAINERS

A free illustrated catalog describing a complete line of containers and services is available. This manufacturer claims to have the most diversified line including craveneer, corrugated, plywood, veneer, and re-sawed materials. Write Dept. MPM, Chicago Mill and Lumber Co., 33 S Clark St., Chicago 3, Ill.

COMPLETE LINE OF STANDARD SWITCHES

The SNAPAC line is designed to provide rugged, dependable switches for a broad range of snap-action switch applications. They have many electro-mechanical features and are listed by UL. Write for SNAPAC Bulletin SL-3, Dept. MPM, Controls Co. of America, Soreng Div., 9559 Soreng Ave., Schiller Park, Ill.

PRE-FINISHED METALS SAMPLER-SELECTOR

This manufacturer of pre-finished metals offers a free sampler-selector from which to select materials. Available in 14 finish-to-base metal combinations, this raw material is said to open wide new horizons in product design. Write Dept. MPM, American Nickeloid Co., Peru 11, Ill.

NEW FLOW COATING MATERIAL

This new enamel developed for flow-coating the finish coat is said to have been proven in production runs by major manufacturers. It is said to flow beautifully, have high gloss, freedom from sags, runs, or pinholes, and require a minimum of supplemental spraying. Write for copy of "IC Ultraflo primers and enamels", Dept. MPM, Interchemical Corp., Finishes Division, 224 McWhorter St., Newark 5, N. J.

MORE ABOUT ENAMELING IRON

If you are interested in learning more about enameling iron and its advantages, write for a copy of "Armco Enameling Iron", Dept. MPM, Armco Steel Corp., 1317 Curtis St., Middletown, Ohio.

COMPLETE STAMPING FACILITIES

This manufacturer offers a brochure outlining their complete facilities. This midwestern job stamping company also outlines the various services offered. Dept. MPM, Detroit Stamping Co., 404 Midland Ave., Detroit 3, Mich.

FINISHES FOR ALUMINUM

A colorful, penetrating handbook prepared by the men who know about aluminum finishes. This booklet includes all the latest and most exciting finishes, and tells how to achieve them. Dept. MPM, Aluminum Company of America, 2194 Alcoa Building, Pittsburgh 19, Pa.

EXTRUDED SHAPE DESIGN

A booklet called "A New Horizon in Extruded Shape Design" is available. It is a thorough text designed to stimulate imaginative thinking about designing and applying extruded aluminum shapes. Dept. MPM, Aluminum Company of America, 2194 Alcoa Building, Pittsburgh 19, Pa.

PAINT PRODUCTION AND LAB FACILITIES

A new 4-page folder describing production and laboratory facilities for its finishes is announced by this paint manufacturer. The bulletin explains and illustrates typical steps in the development of new industrial coatings. These include pigment grinding, mixing and frequent checking to assure proper viscosity, color shade and drying time. Write Dept. MPM, Form LL-4918, Body Bros., Inc., Bedford, Ohio.

COMPLETE INFORMATION ON SCREW LINE

If you are interested in having available complete information on a company that is a source for a complete line of screws and bolts, write for stock list, free samples, and warehouse stock guide, MPM, Box 1360-F, Southern Screw Co., Statesville, N. C.

PLAN BOOK OF METAL MOULDINGS

This booklet outlines the complete line of metal mouldings offered by this company. There is a wide variation for a new design creation. For a copy write Dept. MPM, Pyramid Mouldings Inc., 5365 W. Armstrong Ave., Chicago 30, Ill.

BOOKLET ON GALVANIZED SHEETS

This booklet describes galvanized sheets which are said to save manufacturers up to 15 per cent. The material is said to withstand smashing impact without cracking, chipping, peeling, or flaking. It is, of course, a corrosion resistant material. Write for booklet TI-Co, Dept. MPM, Inland Steel Co., 38 S. Dearborn St., Chicago 3, Ill.

CASTERS FOR APPLIANCES

For information on a complete line of free-swiveling casters, write for a descriptive catalog. Dept. MPM, The Nagel-Chase Manufacturing Co., 2817 N. Ashland Ave., Chicago 13, Ill.

PRINTED WIRING

Have you investigated printed wiring possibilities lately? For full information on how to design for printed circuit panels, write on company letterhead for the second edition of the handbook "Utilization of Prefabricated Wiring". Dept. MPM, Methode Manufacturing Corp., 2021 W. Churchill St., Chicago 47, Ill.

STAINLESS STEEL SHEET AND STRIP

A new 32-page booklet which gives detailed information on these products is now being distributed. The booklet has more than 20 tables including detailed data on a stainless steel finder, corrosion resistance of various stainless steels, fabrication properties, and weight tables per lineal foot in various widths and gauges. There are sections on the proper selection of stainless steel grades, and an industry index of applications in the automotive, food processing, laundry and other industries. Dept. MPM, Advertising Department, Allegheny Ludlum Steel Corp., Oliver Building, Pittsburgh 22, Pa.

1957 REFERENCE GUIDE FOR SILICONES AVAILABLE

Almost 150 commercially available silicone products are described in this year's catalog, including several which were developed within this last year. As in previous annual issues, products are grouped by usage enabling engineers to locate a material by what it does as well as by what it is. Descriptions are brief and factual, with emphasis on charts, tables and graphs directly comparing various silicones with the materials they are displacing. Heavily illustrated with application photographs. Twelve pages, two colors. Dept. MPM, Dow Corning Corp., Midland, Michigan.

HERMETIC MOTORS

Ten page illustrated bulletin shows how high-speed production facilities, quality control, and research are used in manufacturing hermetic motors for the refrigeration and air conditioning industry. Points out application engineering assistance available. Write for bulletin GED-3060, Dept. MPM, General Electric Co., Schenectady 5, New York.

BIMETAL DISC TYPE THERMOSTATS

Bulletin 3000, describes a new line of Stemco Type A bimetal disc type thermostats for electronic, appliance and industrial applications. The bulletin covers the operating principle and illustrates it with a schematic diagram, gives performance data, ratings, dimensions, and construction details. Various mounting arrangements are illustrated with photographs. Both hermetically sealed and semi-enclosed styles are covered. Write for bulletin 3000, Dept. MPM, Stevens Manufacturing Co., Inc., Lexington, Ohio.

AUTOMATIC TRANSVERSE SPRAY FINISHING MACHINES

A new illustrated catalog covering the basic types of automatic transverse spray finishing machines produced by this company has just been issued. Transverse machines of four types are covered in the catalog. The company states that conversion from manual to automatic spray application can increase production rates while at the same time reduce costs. Advantages include uniformity of the spray-applied film, uniformity of lustre, color and texture established material control, and elimination of the fatigue factor. Basic design principles of the transverse machines are a beam with accurate guide rails, a carriage on ball-bearing rollers driven by an endless chain drive and spray guns with completely accurate cams to assure that the guns spray only on the work. Dept. MPM, The DeVilbiss Co., Toledo 1, Ohio.

FRACTIONAL HORSEPOWER MOTORS BULLETIN

16-pages, full-color, this bulletin illustrates design advantages and shows components in integrated insulation system of general purpose fractional horsepower motors used in the equipment manufacturing field on such applications as power tools, heating and ventilating equipment, compressors, fans and water pumps. Publication includes a cutaway drawing of the Form G motor and describes production facilities, quality-control tests, application-engineering assistance, and small motor service station plan available for general purpose fractional horsepower motors. Write for bulletin GEA-6424, Dept. MPM, General Electric Co., Schenectady 5, N. Y.

CUSTOM-MOLDED RUBBER PARTS

A new brochure on custom-molded rubber parts is being offered. The various creative phases covered in the eight-page pamphlet include: engineering consultation, compound selection, mold design and manufacture. Technical specifications include a description of the relative properties of natural and synthetic rubbers. Dept. MPM, Tyer Rubber Co., Molded Rubber Products Div., Andover, Mass.

PORCELAIN ENAMEL IN INDUSTRY

The pocket-sized, 20 page cartoon-illustrated booklet deals briefly with the origin and development of porcelain enameling, its advantages, and features. Mention is made of common uses. For your copy write Dept. MPM, The Erie Ceramic Arts Co., 3120 W. 22nd St., Erie, Pa.

SPRINGRIP FASTENERS

Springrip Fasteners are designed for positive shaft retention. They are said to be simple to apply to rods and studs — assure strength without special preparation and not require costly threading or drilling. These fasteners are in stock and available for immediate delivery. Full details are available in a new catalog No. AF-9. This booklet contains complete technical data, dimensions and application suggestions. Dept. MPM, Fastex Division of Illinois Tool Works, 195 Algonquin Road, Des Plaines, Ill.

MINIATURE LIGHTING ASSEMBLIES, LAMPHOLDERS

A new 16-page catalog of miniature lighting assemblies, lampholders and components has just been issued. The catalog gives full applicating and dimensional data on the numerous units and parts in the comprehensive line, with detailed illustrations and full information on special variations and modifications of standard assemblies. In addition, a general discussion of the purposes and construction of the component parts of assemblies is included, in order to facilitate the selection of the right unit for a given application. Dept. MPM, Drake Manufacturing Co., 1713 W. Hubbard St., Chicago 22, Illinois.

SHADED-POLE MOTORS

A new booklet on shaded-pole motors is available. It contains drawings, technical data and specific applications. Two new basic models are discussed. Series 401 for standard life applications and 402 with a new "Camel Bearing" which holds lubricant thousands of hours longer. Write Dept. MPM, Controls Co. of America, 9559 Soreng Avenue, Schiller Park, Ill.

ALUMINUM FINISHING

New full-color film visually demonstrates every aspect of aluminum finishing from laboratory theory to authentic production-line techniques filmed on-the-spot during mass production. If your plant or technical group is interested, write for full details to Dept. MPM, Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.

WHAT GOES ON HERE?

A new 8-page booklet illustrates and describes the manufacturers products. In basic non-technical and conversational language, the booklet describes Burndy connectors, terminals, splices, panels, and components for the appliance, electronic, aircraft, and military markets. Dept. MPM, Burndy Corp., Norwalk, Conn.

BETTER BASE FOR DURABLE PAINT FINISHES

If you're interested in a better base for a durable paint finish on steel drums or other fabricated metal products write for this bulletin. It describes the various types of the material and gives information which will help you select the proper one for your particular application. Write for bulletin 1380, Dept. MPM, American Chemical Paint Co., Ambler 33, Pa.

to Page 69 →

Castings by ACME ALUMINUM FOUNDRY CO., Chicago

. . . here's your ANSWER!

MACCO
ALUMINUM CLEANER NO. 19

Even the finest organic or ceramic coatings are not satisfactory unless the base metal is CHEMICALLY CLEAN. MACCO No. 19 is a brilliant, new, streamlined 1957 chemical development, *ideal for use in either spray type washer or tank.* This highly efficient cleaner will thoroughly CLEAN and BRIGHTEN aluminum and die cast metal WITHOUT ATTACK. *Just One Operation—No Smut—No Acid Dip.*

simple . . . economical . . . sure

Manufacturers of Better Metal-Working Compounds since 1931

9210 SOUTH SANGAMON STREET • CHICAGO 20, ILLINOIS

MACCO PRODUCTS COMPANY

Short cuts in fabricating-finishing

(Continued from Page 42)

Finished small panels and doors are placed on multi-shelved, horizontal, four-wheeled rack 24 at a time.

Spraying is reduced to its simplest arrangement. Three containers are kept side by side in the all-metal, fireproof paint room. Aluminum, yellow, and bright bronze lacquers are kept in their respective containers. There is no changing of colors . . . all aluminum for interiors and all yellow, or bronze hammer finish for exterior parts. Although some metallic gray is used, those are the basic colors. The colors are applied in one coat except yellow which gets two coats. Spraying is conventional . . . edges first, then tops. Hundreds of small pieces, and as many as 50 assembled units, can be painted per eight-hour shift.

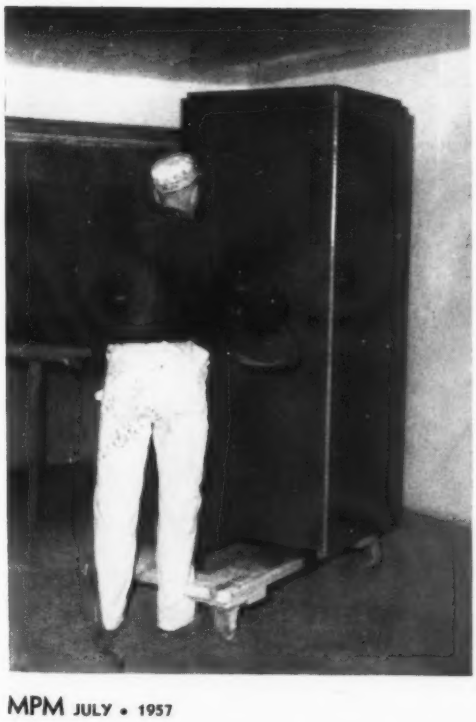
Burner castings are about the only parts handled by the painter as he works. They are set on the turntable, but as they are sprayed with metallic copper enamel, with no thinner, they are picked up for painting reverse sides. Parts are air dried.

Lacquer is used for production reasons . . . costs do not enter the picture. All outside knocked-down pieces or assembled units get either the two coats of yellow or one coat of metallic.

Paints, plus washing thinner used to clean metal before fabrication, are kept in a fireproof (cement blocks with fire-door) paint storage room. Supplies are taken by lift truck to the paint room.

The paint room is cleaned three times a year from top to bottom . . . it being covered with plastic film. Cardboard paper on the floor, wrapping paper on the racks and dollies and trucks are removed at the same time. The turntable paper is changed as often as every four hours. Guns and nozzles are given a thorough overhaul three times a year.

With careful routing of the parts and units, in the limited room available, the one painter and helper finish 375 furnaces each month. During the seasonal peak, from July to September, 500 units are finished per month!



Right — Fan partitions get glass insulations by means of clips pushed through the insulation and then bent down over the wire played out from spool on bench.

Left — Painter sprays Hi-Boy front outlet furnace with bright copper hammer lacquer.

USS VITRENAMEL...
STEEL SHEETS
WILL BE AVAILABLE IN COILS!
This can be good news for appliance and other manufacturers using a quality enameling base sheet. By using USS VITRENAMEL in coils, you may be able to save time and labor on blanking operations. You may wish to investigate the potential economies of coil usage.
For additional information about USS VITRENAMEL, write or telephone the nearest United States Steel Sales Office.
UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, CHICAGO
UNITED STATES STEEL EXPORT COMPANY, NEW YORK
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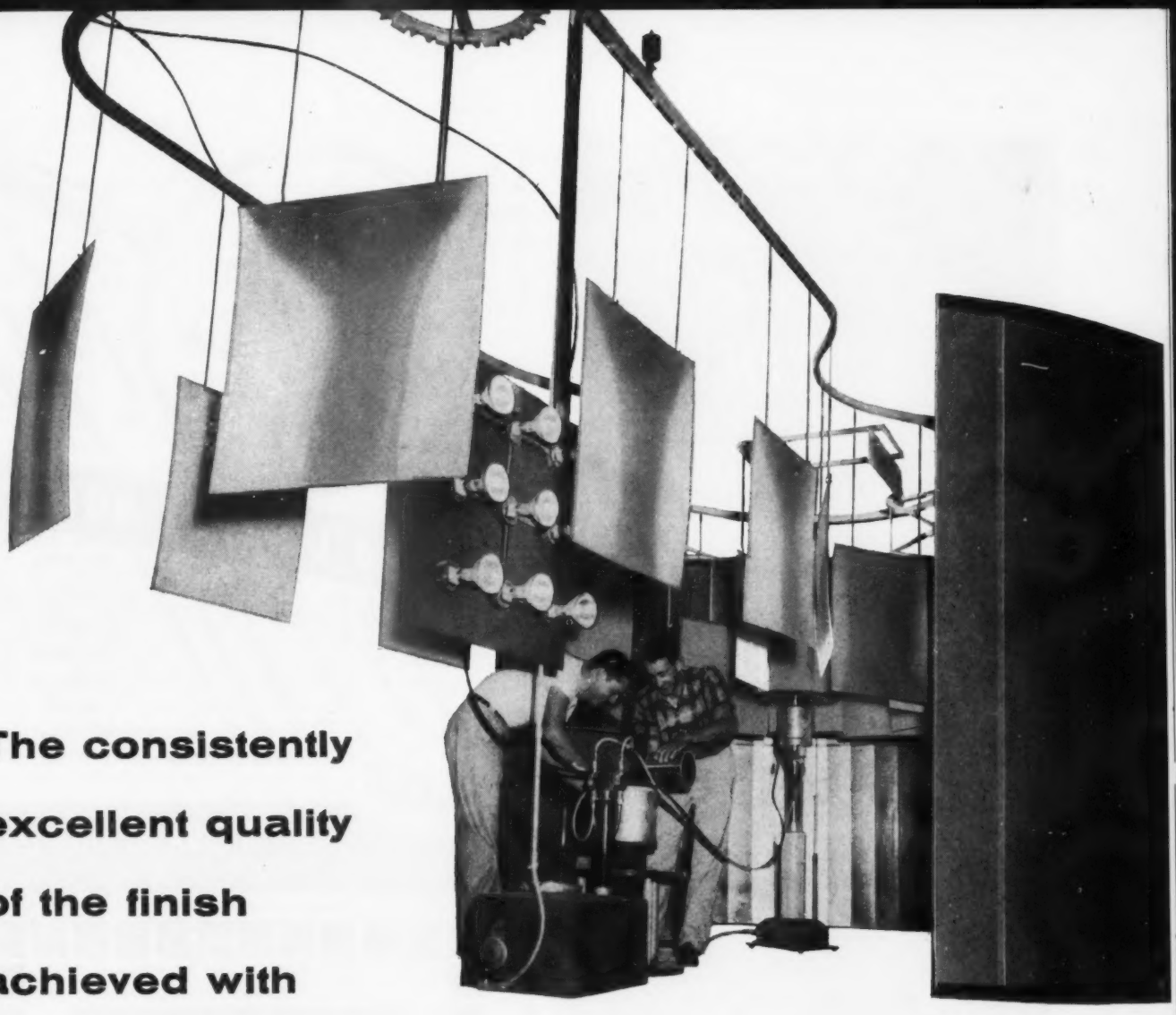


The consistently excellent quality of the finish achieved with

Pemco Covercoats

starts here!

This disc atomizing type electrostatic spraying system at Pemco assures customers who employ this method of spraying in production that frits supplied by Pemco will "behave" properly. In addition to helping customers speed production and cut costs, it will play an important part in the development of entirely new enamels for use by the industry.

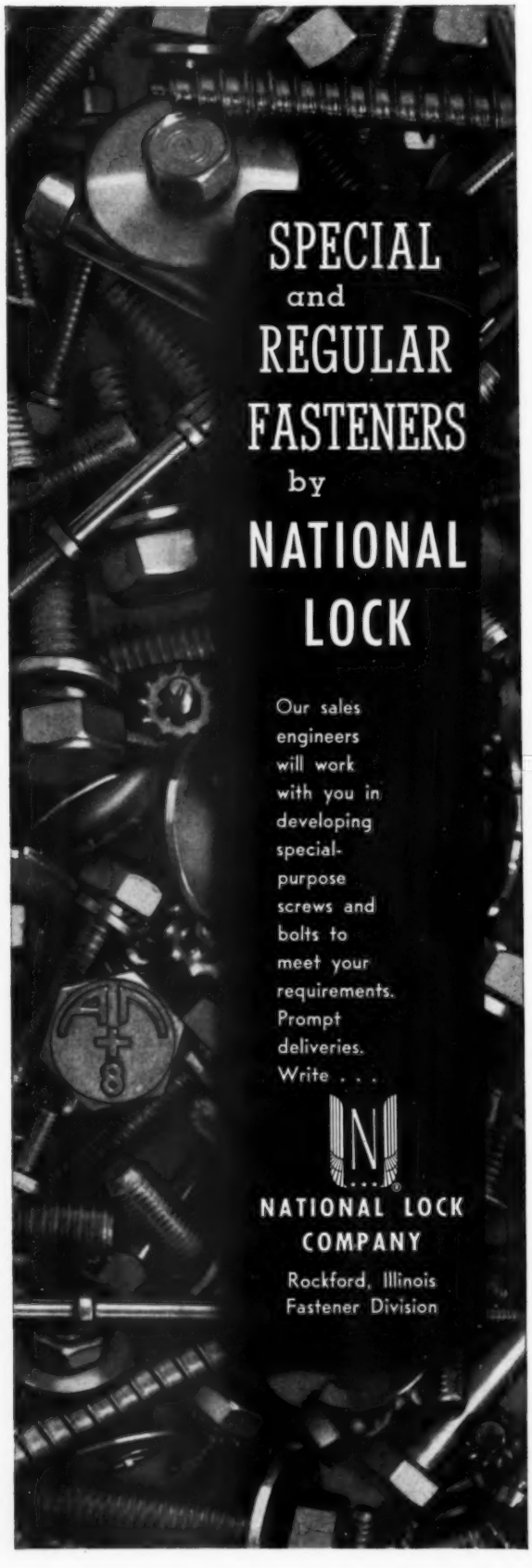
Pemco is the first frit manufacturer to install such facilities for testing and research.

Pemco Service is available to you through the Pemco Engineer in your area.

Manufacturers of "the World's Finest" Porcelain Enamel Frits, Glaze Frits, Coloring Oxides, Screening Pastes, Body and Glaze Stains, Underglaze and Overglaze Colors, Vitrifiable Glass Colors.

PEMCO corporation

BALTIMORE 24, MARYLAND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LOCK
Our sales engineers will work with you in developing special-purpose screws and bolts to meet your requirements. Prompt deliveries. Write . . .
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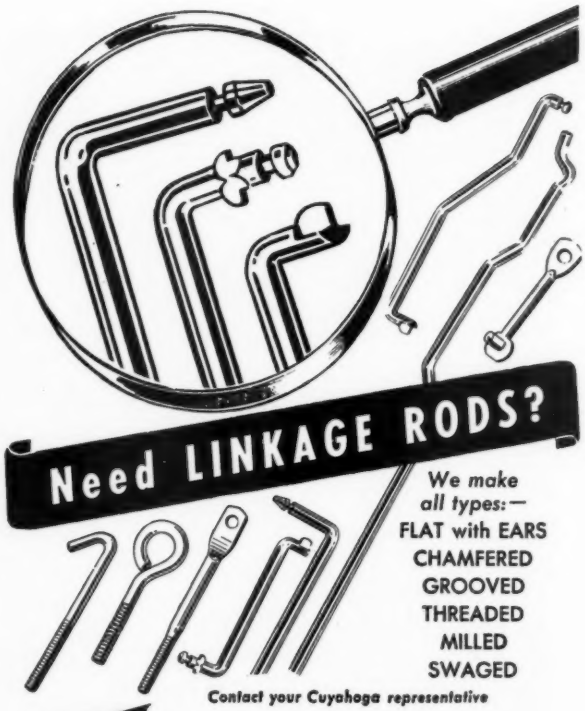
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We make all types:—
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REPUBLIC INDUSTRIAL CORPORATION
The CUYAHOGA SPRING Co.
10200 BEREA ROAD • CLEVELAND 2, OHIO

HELP YOUR HEART FUND
HELP YOUR HEART

New Literature

→ *from Page 63*

PERFORATED METALS

A general catalog on perforated metals is offered. The catalog states that the design, pattern and open area for almost every application may be selected from the company's perforating dies at no charge for tooling. The company can perforate practically any material that can be obtained in coils, sheets or plates — from foil-thick to 1" thick. Write for catalog No. 62, Dept. MPM, The Harrington & King Perforating Co., Inc., 5640 Fillmore St., Chicago 44, Illinois.

SILICONE CATALOG

A new illustrated catalog discussing more than 115 different applications for silicones is now available. Among the important silicone uses described are rubber products, electrical insulation, water repellents, lubricants, release and anti-foam agents. Designated CDS-97, the condensed eight-page catalog lists specialized literature covering product and application information as well as major silicone products. Dept. MPM, Silicone Products Department, General Electric Co., Waterford, New York.

FINISHING EQUIPMENT

This bulletin describes a complete line of finishing equipment and systems. The bulletin is entitled "Maximum finishing oven efficiency." Write Dept. MPM, Finishing Division, Michigan Oven Co., 411 Brainard, Detroit 1, Michigan.

INDUSTRIAL LUBRICATION AND ACCESSORIES CATALOG

A new 32 page catalog featuring automatic and air-powered industrial lubricating equipment, paint and mastic spray units and accessories has been announced. Complete units for maintenance and production spraying of paints, mastics and similar materials are included, together with a wide selection of accessories. Write for Catalog 403, Dept. MPM, Gray Co., Inc., 1039 Sibley St., N.E., Minneapolis 13, Minnesota.

CORRUGATED FIBER BOXES

A booklet is offered on corrugated fiber boxes. This booklet fully illustrates this company's services, facilities and products. For complete information write for "This is Inland", Dept. MPM, Inland Container Corp., Indianapolis 6, Indiana.

METAL PRODUCTS STATISTICS

a current report on available production, shipment and sales figures for important products in the appliance and fabricated metal products manufacturing field

GAS WATER HEATERS — April shipments 240,900, only a few hundred below the 241,200 in '56; first four months 891,000, 11.5 per cent below '56.

GAS RANGES, BUILT-IN — April shipments 14,000, 7.3 per cent down from '56; first four months 55,200, 11.7 per cent gain over '56.

GAS RANGES, FREE-STANDING — April shipments 151,100, 6.4 per cent below '56; first four months 600,100, 11.1 per cent below '56.

GAS FURNACES — April shipments 49,600, 11.1 per cent below '56; first four months 194,100, 11.8 per cent below '56.

GAS-FIRED BOILERS — April shipments 6,000, 7.7 per cent below '56; first four months 22,300, 5.1 per cent below '56.

CONVERSION BURNERS — April shipments 9,600, the same total as '56; first four months 30,500, 13.1 per cent below '56.

ELECTRIC REFRIGERATORS — April industry sales 281,600, 20.2 per cent below '56; first four months 1,195,000, 13.5 per cent below '56.

ELECTRIC FREEZERS — April industry sales 70,900, 25.6 per cent below '56; first four months 294,100, 14.0 per cent below '56.

ELECTRIC RANGES, BUILT-IN — April industry sales 35,200, 6.0 per cent above '56; first four months 147,400, 21.4 per cent above '56.

ELECTRIC RANGES, FREE-STANDING — April industry sales 72,000, 42.0 per cent below '56; first four months 371,400, 26.3 per cent below '56.

ELECTRIC WATER HEATERS — April industry sales 65,600, 18.5 per cent below '56; first four months 250,700, 19.6 per cent below '56.

ELECTRIC DISHWASHERS — April industry sales 26,000, 31.5 per cent below '56; first four months 133,000, 12.5 per cent below '56.

ELECTRIC FOOD WASTE DISPOSERS — April industry sales 38,400, 31.5 per cent below '56; first four months 175,600, 20.2 per cent below '56.

COMBINATION WASHER-DRYER — April factory sales 12,611, 41 per cent below March '57; no comparable '56 figures available.

WASHERS, AUTOMATIC & SEMI-AUTOMATIC — April factory sales 169,573, 28 per cent below '56; first four months 885,271, 21 per cent below '56.

WASHERS, WRINGER & ALL OTHER — April factory sales 61,102, 32 per cent below '56; first four months 282,503, 30 per cent below '56.

ELECTRIC DRYERS — April factory sales 27,767, 44 per cent below '56; first four months 268,965, 26 per cent below '56.

GAS DRYERS — April factory sales 15,083, no change from '56; first four months 116,691, 10 per cent below '56.

IRONERS — April factory sales 3,249, 32 per cent below '56; first four months 14,733, 23 per cent below '56.

VACUUM CLEANERS — April factory sales 281,627, 20.2 per cent below '56; first four months 1,171,998, 12.3 per cent below '56.

METAL FURNITURE — April shipments were 3 per cent below '56; first four months were 21 per cent below '56.

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, and National Association of Furniture Manufacturers.

WILLIAM SCHUBERT ELECTED NEW AHLMA DIRECTOR

William L. Schubert, general manager, laundry equipment, Philco Corp., Philadelphia, Pa., has been elected a director of the American Home Laundry Manufacturers' Assn., according to an announcement by Guenther Baumgart, executive director of AHLMA. Schubert joined Philco in 1954 as product manager, home laundry equipment, and was appointed to his present position in July, 1956. Previously, he served in various plant management capacities, including industrial design and development work.

TRANE COMPANY PICKS SITE FOR NEW SOUTHERN PLANT

The Trane Company, one of the nation's major air conditioning and heating equipment manufacturers, has announced that it has selected Clarksville, Tenn. as the site for a Southern plant.

Plans are to move forward with the plant at Clarksville as soon as possible. The plant, to cost about $2 million to construct and equip for production, will manufacture central residential air conditioners for year-round heating and cooling, marking entry into a new segment of air conditioning for Trane. Production is scheduled for 1958.

Trane has its headquarters and main manufacturing facilities in La Crosse, Wis., with plants in Scranton, Pa., and Toronto, Ont., Can.

WHIRLPOOL OFFERS MIXED-CAR, MIXED-TRUCKLOAD SHIPMENTS

Arrangements have been completed by Whirlpool Corp. for shipment of mixed-product carloads and truckloads of RCA-Whirlpool appliances directly to dealers who order in those quantities, it was announced recently by John L. Bricker, vice president.

As point of origin for the shipments, the company has a warehouse at Anderson, Ind. The warehouse is at the exact center of the nation's business map, and also centrally located in relation to Whirlpool manufacturing divisions.

EASY APPOINTS NEW WESTERN MICHIGAN DISTRIBUTOR

Independent Distributors, Inc., have been appointed distributors of Easy Laundry Appliances for the Western area of Michigan, according to James G. Koontz, national field sales manager for Easy, Chicago.

The Western Michigan area was formerly covered by Major Appliances, Inc., which will continue to serve the Eastern section of Michigan, exclusive of the Detroit area.

NAM REPORTS 1956 NATIONAL INSTALLMENT DEBT BELOW '55

Americans borrowed $39.6 billion last year, but they made payments on previous debts which amounted to almost as much, according to Federal Reserve Board statistics released through the Chicago office of the National Association of Manufacturers.

Repayments on credit loans totaled $37.1 billion during 1956, the report stated, which left a total installment debt at the end of the year of $31.5 billion compared with $29 billion at the end of 1955.

The NAM report pointed out that the net increase of $2.5 billion in the national installment debt last year was considerably below the $5.5 billion increase which was reported for 1955.

NEW SUNBEAM PLANT PLANNED

Sunbeam Corp. plans to build a new one and a half million dollar die casting plant. R. P. Gwinn, president, said that it would be built within the next nine months. It is to be located at the company's headquarters in Chicago, and will add 45,000 square feet to the plant facilities.

GAS CENTRAL HEAT UNITS SHOW TREND TO MORE CAPACITY

A strong trend toward higher capacities in gas central heating equipment is shown in a study, by the Gas Appliance Manufacturers' Assn., of sales over a five-year period.

In the case of both gas-fired furnaces and of boilers for residential use, a larger proportion of production has gone into units of greater BTU input. The smallest sizes, as measured in heating capacity, show the largest declines in percentages of total output. Sharp gains in over-all production meant that in almost every classification the number of units shipped actually increased.

RYAN WILL OPEN LOS ANGELES PLANT

Ryan Aeronautical Co., San Diego, Calif., announced recently acquisition of an assembly plant and 27-acre industrial site adjacent to the Torrance Muncipal Airport. The factory facilities, containing 137,000 square feet of floor space, and formerly occupied by National Electric Products Corp., will help meet pressing requirements for additional assembly space as production accelerates on military and commercial contracts, T. Claude Ryan, president said.

NORTHWEST ATA ANNOUNCES NEW OFFICERS

Northwest Appliance & Television Assn., Seattle, Wash., which numbers 61 members, has announced election of the following officers for 1957: Fred Egge, Ware & Hosey, president; Jack Stewart, Stewart-Sullivan Electric Co., 1st vice president; Henry Murray, Henry Murray's, 2nd vice president; and David M. Lombardo, Organization Service Bureau, executive secretary.

The group is a veteran affiliate of the National Appliance & Radio-TV Dealers Assn.

ARI TENTH EXPOSITION COMING TO CHICAGO IN NOVEMBER

The Tenth Exposition of the Air-Conditioning and Refrigeration Industry, scheduled to be held in the International Amphitheatre, Chicago, November 18-21, will occupy approximately 100,000 square feet of net exhibit space, according to reports. About 300 exhibitors are expected to show their wares, and it is anticipated that the 1957 show will be of greater magnitude than the show held in Atlantic City last year.

It will be the first time that the doors of the ARI exposition will be opened to

THERE MUST BE A GOOD REASON WHY
A HIGH PERCENTAGE OF IMPORTANT
HEATER MANUFACTURERS ARE USING

ING-RICH FRITS

FOR colored ground coats

only WHEN YOU COMBINE SCIENTIFIC KNOWLEDGE WITH PRACTICAL EXPERIENCE CAN YOU GET genuine know-how.

Ing-Rich ceramic engineers working day in and day out with our own job enameling plant technicians have produced "Plant tested Frits" which are giving our Heater customers these big advantages—

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We would welcome the opportunity, without obligation, to prove to you that you too can gain from this valuable "Know How."

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the public, and it is expected that many thousands of interested visitors, aside from members of the industry, will visit the show.

Included among industry groups planning annual conventions immediately before, during, or immediately following the exposition, are American Society of Refrigerating Engineers and National Warm Air Heating and Air-Conditioning Assn.

WASHER MARKET STILL BIG, SAYS PIONEER

Sales of 20,000,000 automatic washers in the next seven years will equal that for its first 20 years, as the trend to automatic home laundering mushrooms, said Judson S. Sayre, president of Norge division, Borg-Warner Corp., Chicago. Recalling the day, 20 years ago, when he and his associates showed the automatic washer for the first time in the Hotel Blackstone, Chicago, Sayre said, "We sold 48,000 showing only a working laboratory model, but we did not dream that some day in 1957 the 20,000,000th machine would be sold by a dealer somewhere in the country, or, by this year, have piled up $5,500,000,000 in retail sales value."

COLORED PLUMBING FIXTURE SALES ON INCREASE, REPORT

The ratio of colored plumbing fixtures to white has almost doubled in the last four years, according to the Plumbing and Heating Industries Bureau. In 1953, only 15.53 per cent of all fixtures sold were colored, while in 1956 the percentage had increased to 26.33 per cent.

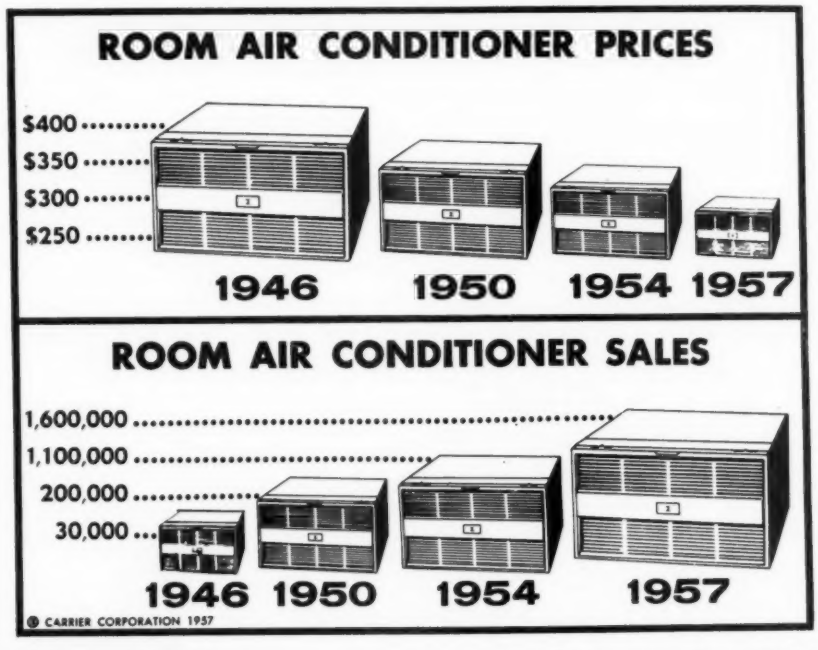
Most popular of all colors is coral or pink, according to a survey made by the Plumbing Fixture Manufacturers' Assn. among its members producing vitreous china and enameled cast iron fixtures. Second in popularity was green. Other colors, in order of public preference, are blue, gray, tan, and yellow.

TEMCO ANNOUNCES NEW PIN-UP UNVENTED HEATER

A cool cabinet unvented heater that hangs on the wall, firmly attached by four screws, has been announced by Temco, Inc. The new unit follows the recent announcement of a "Thru-the-wall" vented heater by the Nashville concern, and further rounds out its nationally promoted line of gas heating equipment. In addition to these two units, Temco makes room heaters, floor furnaces, wall heaters, unit heaters, and warm air furnaces with combination air conditioning.

ROOM AIR CONDITIONER SALES UP, PRICES DOWN IN PAST DECADE

The prices of room air conditioners have decreased in the past ten years while, at the same time, the cost of almost all other manufactured products has risen. Increasing sales volume, shown in the lower part of the chart, is only part of the answer, Carrier Corporation officials report. Another extremely important factor is engineering design for lower cost production. Dollar figures in the upper part of the chart show average retail cost for similar units for each of the four years listed. Figures in the lower section are for units. The 1957 estimate is based on the prediction of Cloud Wampler.



WATER SOFTENER SALES SET RECORD

Water softener sales in 1956 topped the half-million figure, exceeding by nearly 100,000 the previous all-time high registered in 1955, according to the Plumbing and Heating Industries Bureau. Automatic gas water heater sales also set a record in 1956. Sales were 2,773,600, or .9 per cent above the level in 1955. Sales last year of electric farm pumps and water systems declined to 764,105 from the 1955 all-time high of 796,332 units.

NHMA CITES NEED FOR LARGER EXHIBIT SPACE

Lack of larger exhibit halls and too few hotels in the nation's major cities limit the ability of a booming industry to parade its products, Dolph Zapfel, secretary of the National Housewares Manufacturers Assn., told New York Housewares Club members at the George Washington hotel recently. Speaking at the club's monthly dinner meeting, Zapfel cited his organization's two annual shows as prime examples of the need for exhibit space to meet the demands of a fast growing industry. "The exhibit each year draws more than 50,000 housewares manufacturers, salesmen, buyers, merchandise managers, and other top buying personnel from all 48 states, Canada, and abroad," Zapfel stated.

GENERAL ELECTRIC AWARDS FIFTY SCHOLARSHIPS

Fifty Scholarship Awards of $650 each for the 1957-1958 academic year have been made by the trustees of the General Electric Educational and Charitable Fund to General Electric employees, their children, and qualified children of pensioned or deceased employees. In addition to the Scholarship Awards, unrestricted grants of $350 for each winner will go to the regionally accredited college or university attended by the award recipient. The awards total $50,000.

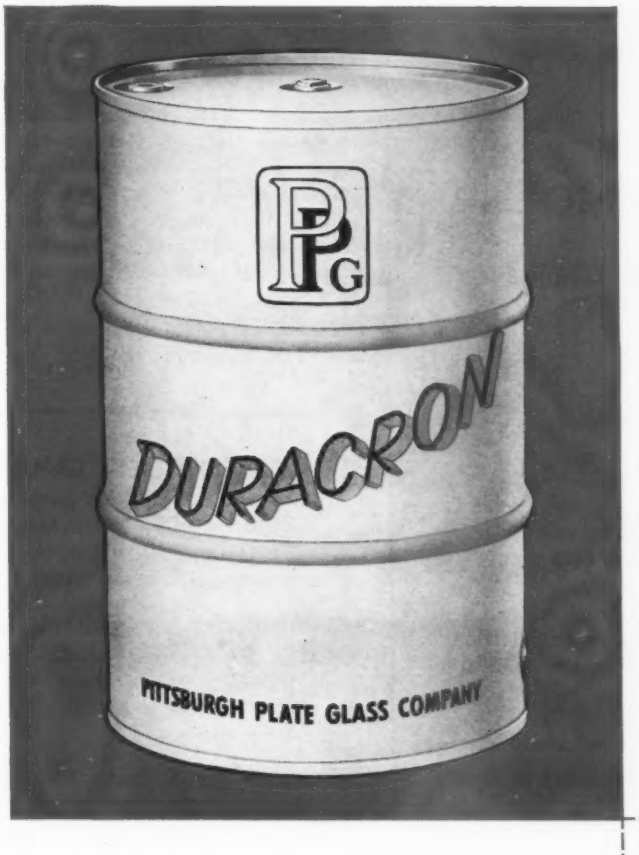
ARI REPORTS COMPRESSOR BODY SHIPMENTS BY MANUFACTURERS

Manufacturers' shipments of compressor bodies used in air-conditioning and refrigeration units were up more than 11 per cent in the first two months of this year as compared with the same

Amazing New Chemical Composition!

DURACRON

Thermo-Setting Acrylic Enamel



Sets a new standard for industrial finishes in toughness, durability and mar resistance!

• **Pittsburgh's new DURACRON** is a revolutionary departure from today's baked enamels. It is a basically new chemical composition developed for the finishing of refrigerators, home laundry equipment, ranges and air conditioning units.

• **It has superior adhesion** to bare metal or primer. It is remarkably tough and durable either as a one-coat enamel or over primer. It retains color and gloss for prolonged periods at temperatures up to 400°F. DURACRON also provides greater resistance to detergents, will not show stains from grease, fruits, mustard, etc. It withstands effects of salt spray, humidity and other corrosive atmosphere. In short, it's a sanitary, taste-free, mar-proof liner for food cabinets.

• **New DURACRON** can also be used advantageously on many other products to improve performance of enamels now used. We'll gladly provide you with additional information. Mail coupon below to Pittsburgh Plate Glass Company, Industrial Finishes Division, 1 Gateway Center, Pittsburgh, Pa.

PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

Pittsburgh Plate Glass Company, Industrial Sales Division, 1 Gateway Center, Pittsburgh, Pa.

Gentlemen: Please send me additional information about your revolutionary new DURACRON.

Name_____

Company_____

Address_____

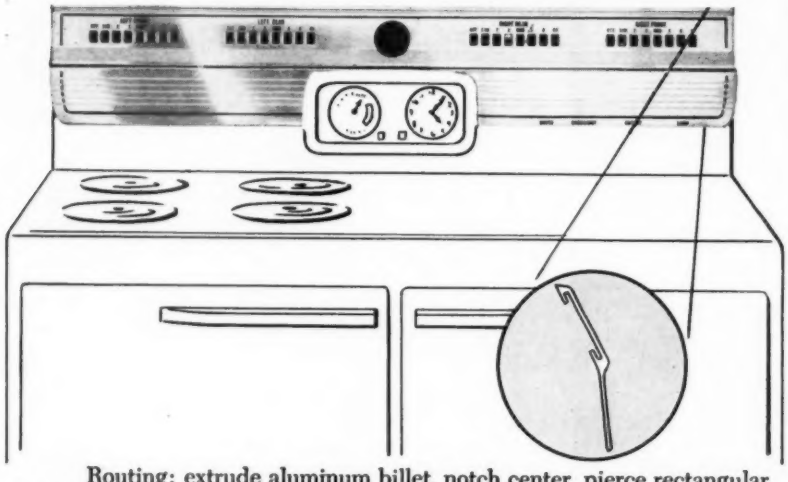
City_____ County_____ State_____

period a year earlier, according to the Air-Conditioning and Refrigeration Institute. Actual shipments for the two-month period totalled 856,261 compared with 770,964 in the first two months last year. These totals do not include compressors designed for use with ammonia refrigerants.

AIR-COOLED PACKAGED AIR CONDITIONERS ANNOUNCED

Expansion of the Airtemp Division, Chrysler Corporation's line of air-cooled air conditioning equipment has been announced recently by Sydney Anderson, Jr., manager, air conditioning & heating sales. With the development of two new remote air-cooled condensers, the firm now offers waterless commercial packaged air conditioners in sizes up to 30-ton capacity. The condensers, two or more as required, operate in conjunction with the standard 10 to 30-ton packaged units, and feature a new control system that will permit them to operate anywhere between 0° to 120° outside air temperature.

LIGHT METALS CORPORATION CREATES NEW PRODUCTION ECONOMIES WITH *Extruded Aluminum*



Routing: extrude aluminum billet, notch center, pierce rectangular holes, end closed, exposed face buffed, copper anodize, silk screen the numerals and baked enamel numerals. All done in our own plant – you make one buy . . . one follow-up!

Here's how one manufacturer took full advantage of our complete fabrication facilities to obtain an unusually beautiful switch panel that not only resulted in production economies, but so enhanced the attractiveness of the end product that it actually increased sales!

Whether you manufacture refrigerators, ranges, air conditioners, or any other product; whether you've been using **extruded aluminum**, or whether you haven't; it will pay you to investigate the possibilities provided by our complete **extruding, fabricating** and **anodizing service.**

We'd like to send you a copy of our new brochure. In it you will see some unusual applications and many new ways of using **extruded aluminum.** The chances are you will get an idea or two for your own use.

Send for your free copy today!

LIGHT METALS CORPORATION

EXTRUDED ALUMINUM • COMPLETE FABRICATIONS FACILITIES • ANODIZING
1223 Monroe N.W. **Grand Rapids 5, Michigan**

BISBEE RETIRES FROM WESTINGHOUSE JULY 1

Ralph F. Bisbee began his career with the Westinghouse Electric Corp., Mansfield-Ohio plant, in 1918. In 1940 he was appointed manager of the quality control department in charge of insuring the quality of Westinghouse household appliances. In addition, he was placed in charge of: process control, gage and instrument laboratories, salvage division, packing engineer, quality analysis, and Safe Transit laboratories.

In 1937 he was awarded the Silver W, Westinghouse's highest Order of Merit for his contributions to quality control and salvage of materials, and organizational ability.

Active in industry and local civic affairs, Bisbee has been and will continue as general chairman of the National Safe Transit Committee, Washington, D. C. He was chairman of Sub-Committee III of Committee C-22, American Society for Testing Material, Philadelphia, Pa.; was a member of Quality Development Committee, Porcelain Enamel Institute, Washington, D. C.; and the National Industrial Traffic League, Washington, D. C.

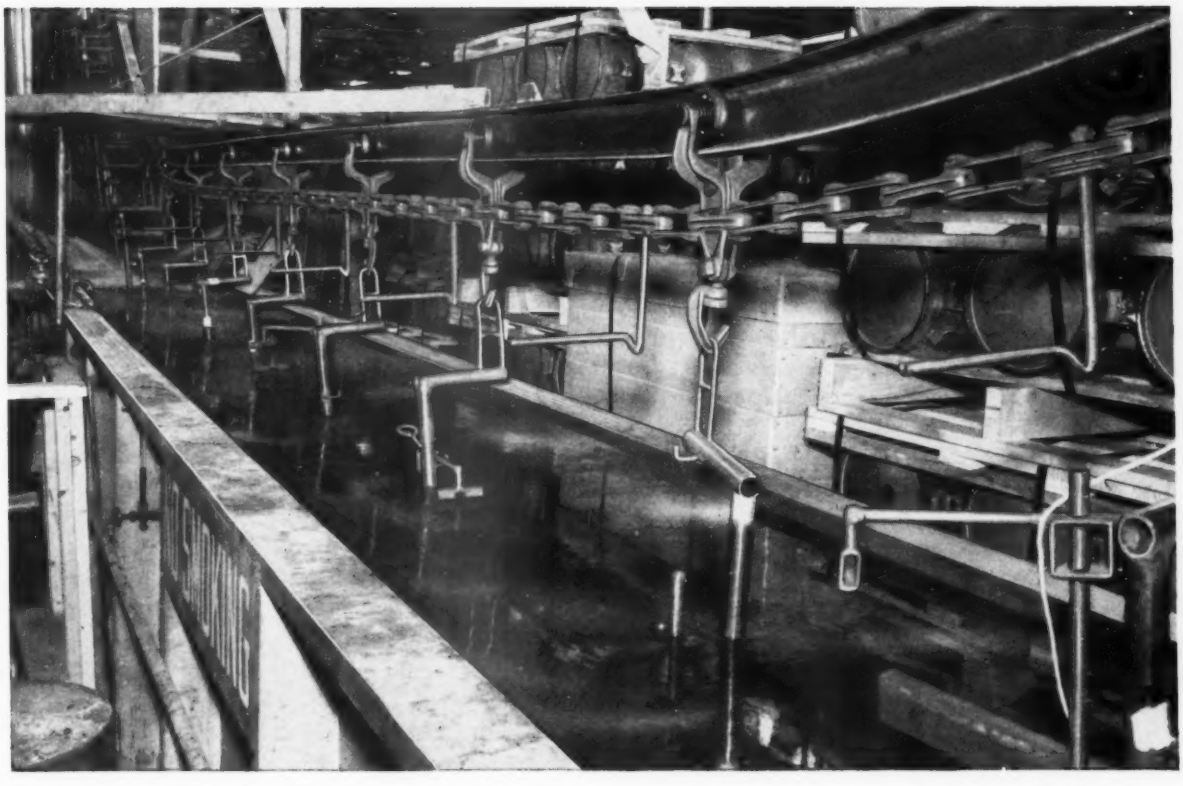
Bisbee will continue as one of MPM's five technical consultants.

FIVE NEW FIRMS JOIN GAMA

Five new members have joined the Gas Appliance Manufacturers' Assn. according to Harold Massey, GAMA managing director. The newly-elected firms are: El-Mech Tools, Ltd., Welland, Ont., Can.; Noland Tank & Galvanizing Co., Nashville, Tenn.; Metters, Ltd., Perth, West Australia; Athens Stove Works, Inc., Athens, Tenn.; and Philco Corp., Philadelphia, Pa.

DATAMATIC ENLARGES 'BRAIN' FACTORY

Expansion of production facilities of Datamatic Corp., Boston, manufacturer of large-scale electronic data-processing systems, owned jointly by Minneapolis-Honeywell and Raytheon, was reported recently by Walter W. Finke, president. The firm has acquired an additional 75,000 square feet of factory space to



PAINT REMOVING COMPOUNDS BY KERNS

If you have a paint removal problem contact Kerns. Whether your particular problem requires a Caustic-type, Solvent-type or Flush-off type stripper a Kerns technical service representative can help you.

As manufacturing chemists and producers of *specialized* compounds, we offer our technical services to the appliance and fabricated metal products field. Phone for a personal contact or mail the details of your problem to our Technical Service Department for *quick action.*

PRODUCERS OF:

Drawing Compounds—Cutting Compounds—Forging Compounds—Grinding Compounds—Phosphatizing Compounds—Wire Drawing Compounds—Rope and Twine Compounds—Cleaning Compounds—Cling Oils —Rolling Oils—Rust Preventives—Wire Rope Lubricants—Specilazed Greases—Spray Booth Compounds.

L. R. KERNS COMPANY
2659 East 95th Street Chicago 17, Illinois
Subsidiary Plant
KERNS PACIFIC CORPORATION
630 N. Batavia Street Orange, California
Offices in principal cities throughout the U. S. A.

enlarge production of its electronic "brain" systems of the $2-million to $2-¼-million class.

The addition of the new space, the third major physical expansion move for the two-year-old company, brings its total plant area to 130,000 square feet. Occupancy is scheduled for late summer.

RETMA members hold 33rd annual convention

THE 33rd annual convention of the Radio-Electronics-Television Manufacturers' Association, heavily attended by representatives of all segments of the industry, was held at the Sheraton hotel, Chicago, May 15-17. High on the list of activities during the three-day session were the efforts of the RETMA board of directors and members of the association's five divisions to expand its activities and services to better serve the varied interests of the electronics industry.

In response to proposals by several RETMA divisions, the board of directors reviewed the question of whether the association name should be changed in the interest of simplicity, and to encompass the expanding interests of its members. It was unanimously concluded that such a change should be recommended to the membership. RETMA officers were directed to prepare the necessary forms and submit the board's recommendation to the membership for action within the next few weeks. After considering a variety of new names, the directors agreed that "Electronic Industries Association" would be most appropriate and indicative of the varied segments of the electronics industry, and the proposed new name will not become effective until it is approved by a majority of members in a formal vote.

Baker re-elected president

Dr. W. R. G. Baker, vice president of the Electronics division of the General Electric Co., was re-elected president of the association for a second term. In his annual report to members on the first day of the convention, Baker said: "After several years of internal reorganization, the past year has been one of relative calm and consolidation for RETMA. While there has been the usual run of problems and some disagreements among members, there have been no serious threats to our unity or our perpetuity. Instead, all members have worked together toward the continuing advancement of the electronics industry and the strengthening of our trade association.

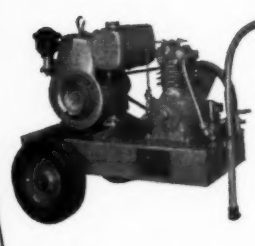
Max F. Balcom, director and consultant, Sylvania Electric Products Inc., was presented the 1957 RETMA "Medal of "Honor," the electronics industry's highest award for outstanding service, by association President Baker. Balcom received the award at the industry dinner in the Grand Ballroom of the Sheraton. In making the presentation, Baker said, "I'm sure that our Awards committee could not have selected anyone to receive the 1957 Medal of Honor who is held in greater esteem by his colleagues than Max Balcom."

Re-elected as vice presidents by the board of directors were: Robert S. Bell, Consumer Products (Set) division; R. E. Carlson, Tube and Semiconductor division; Herbert W. Clough, Parts division; H. J. Hoffman, Technical Products division; and F. R. Lack, Military Products division. William L. Reynolds, formerly assistant general counsel, was elected general counsel to succeed Glen McDaniel by the newly-organized board of directors. Director Leslie F. Muter was re-elected treasurer for the 22nd year, and James D. Secrest was re-elected executive vice president and secretary.

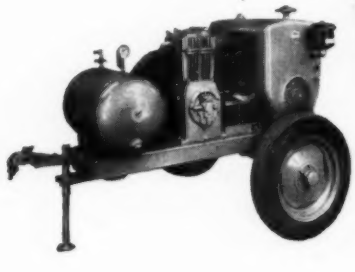
to Page 96 →

Binks Complete Line offers you
the right size and type of
AIR COMPRESSOR
to meet your special needs

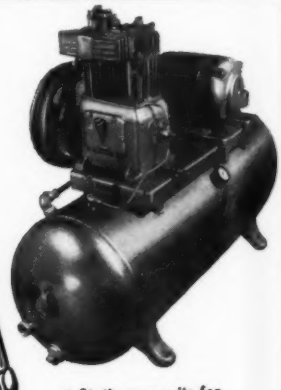
● For home and light maintenance work



● For small one-man contractor use



● Heavy duty air compressors for use by general painting contractors



● Stationary units for small plants and garages

MARSHALL HEADS GAS APPLIANCE ENGINEERS SOCIETY

Stan C. Marshall of Minneapolis-Honeywell Regulator Company has been elected to the presidency of the Gas Appliance Engineers Society. His office became effective June 1.

Other new officers are: vice president, D. R. Weidenfeller, Baso, Inc.; treasurer, Keither T. Davis, of Carrier Corporation; and trustee for a three-year term, M. J. Caparone, of Grayson Controls Division, Robertshaw-Fulton Controls Company.

Jess Reznor, Reznor Manufacturing Company, has been appointed secretary for the coming year of GAES (which members pronounce as "GAS").

Membership of the organization, which was formed four years ago, now exceeds 175, a spokesman announced at the recent annual meeting at the Hotel Carter, Cleveland, Ohio.

Voting members are engineers with at least eight years' experience in the gas appliance industry, including three years of development engineering in gas appliances. Other (non-voting) grades of membership provide for admission of younger engineers engaged in gas appliance engineering, and non-engineers of recognized leadership in work related to gas appliance engineering.

The GAES constitution provides that the organization's objectives shall be accomplished by:

Advancing the theory and practice of gas appliance engineering and of the allied arts and sciences;

Promoting a broader understanding of industry problems and requirements;

Providing forums and media through which experience and information which is of common interest and benefit to the gas industry may be reported, discussed, and published for the common good;

Promoting standardization of terminology, techniques and laboratory test methods;

Encouraging research and imagination for the improvement of gas appliances;

Offering awards and other honors to encourage and recognize meritorious contributions to the industry and to the Society;

Studying means for increasing the effectiveness of Engineering man hours;

Encouraging students and young engineers to enter the gas appliance field by publicizing its opportunities.

ROOM AIR-CONDITIONER RATINGS IN Btu's PUBLISHED

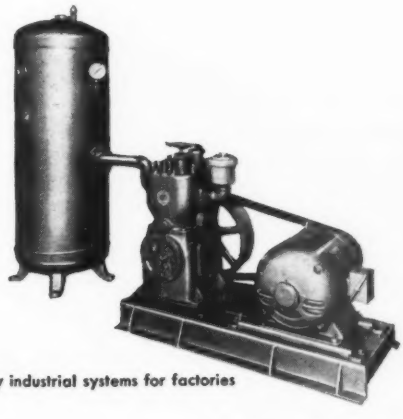
Twenty-five manufacturers of room air-conditioners, representing about 90 per cent of U. S. production of such units, have published the capacity ratings of all their 1957 models in terms of Btu's per hour, it has been announced by the Air-Conditioning and Refrigeration Institute. Most of the makers have published the ratings in their specification sheets and other consumer literature; all 25 have provided ARI with the ratings with authorization to publish them and make them available to the trade press, the industry, and others.

MORE MONEY TO BE SPENT ON HOME MODERNIZATION

People are planning more home modernization and less new home buying this year, Federal Reserve Board surveys show. The board contacted 2,700 families in 66 areas throughout the country. They asked what Americans intend to buy, and how much they will spend.

This year, 8.4 per cent of those interviewed expect to buy a house. For the last two years 9.4 per cent had planned to buy new homes.

On the other hand, 24 per cent plan to spend at least $460 on improving their homes. Last year only 22.2 per cent expected to spend $370 or more.

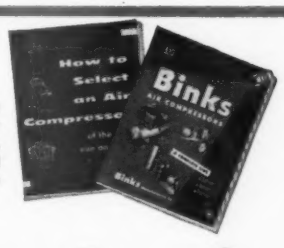


● Heavy duty industrial systems for factories

For each job there is an air compressor that is just right...one that gives you the volume and pressures you need with maximum flexibility and economy. The Binks Line of air compressors gives you a choice of 50 models from compact ¼ h.p. portable units to almost any size you need... each designed to do a specific job or to fit into a given air supply system. Before you buy or specify a new compressor, investigate the Binks Line ...it will pay you!

To be sure you get the right compressor

Ask your jobber or write direct to us for a copy of *How to select an Air Compressor* which tells you what to look for in an air compressor and *Binks Catalog 820* which shows available models, accessories, etc. Or, if you wish, a Binks Engineer will call at your plant and help you pick the right equipment to give you long service and low operating costs. No obligation.



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3122-40 Carroll Ave., Chicago 12, Ill.

REPRESENTATIVES IN PRINCIPAL U.S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY

INDUSTRY PERSONALS

The promotion of *James E. Doughty* as assistant to the national manager of home laundry equipment sales was announced by Norge division, Borg-Warner Corp., Chicago.

Dan R. Nighswander has been appointed national manager of home laundry equipment sales for Norge division, Borg-Warner Corp., Chicago, it was announced recently.

DOUGHTY

NIGHSWANDER

James H. Jewell, vice president in charge of sales for Westinghouse Electric Corp., has been appointed to the new post of vice president in charge of marketing.

Sterling Swanger has been named chief methods engineer for The Maytag Co., Newton, Iowa, replacing Cyril Vande Water, recently resigned. Newly-appointed supervisor of methods engineers at the appliance manufacturing firm will be *Kenneth Johnson*, former senior methods engineer.

Curvin J. Trone, Jr. has been appointed to the newly-created post of director of budgets for Whirlpool Corp., it was anounced recently by Edward C. Cudmore, controller.

The appointment of *Robert F. Marlin* as purchasing agent for the Parts division of Sylvania Products Inc. has been announced by Merle W. Kremer, division general manager.

George J. Easter, research director of Electro Refractories and Abrasives Corp., has been appointed chairman of the Edward Orton, Jr., Memorial Lecture committee of the American Ceramic Society.

Appointment of *Robert G. Watkins*, Wichita, Kansas, as district manager in Michigan for Armstrong Furnace Co. has been announced by Charles L. Brooks, sales manager for Armstrong.

The appointment of *James G. Beggs* as manager of the Dover plant of American-Standard's Youngstown Kitchens division has been announced by H. O. Smith, the division's vice president of operation.

WATKINS

BEGGS

Robert P. Marshall has been named factory superintendent of the new Trane plant to be erected in Clarksville, Tenn. The announcement was made by Richard Schiewetz, general manager of the new plant.

Robert E. Evers has been named junior design engineer in the research department of The Maytag Co., Newton, Iowa. He is among the first to complete the Maytag company's engineering and manufacturing training program since its recent revision.

A Farewell to
CADMIUM
BLISTERS
See these blisters? We have to scrap almost all these parts. We're not getting the cutting oil off in the spray washer.
Hi, Jack, looks like I got here just in time!
"Say, Burt, how did Pennsalt develop this cleaner?" "Well, Jack, nobody knows more about metal-processing chemistry than Pennsalt. Our Whitemarsh Research Lab is constantly working on problems like yours, and Cleaner 38 is just one of their outstanding successes. By the way..."
...you can store these parts for a day or so before putting 'em on the plating line. The unrinsed cleaner film will prevent rusting.
Fine—I won't have to keep both lines running together now.

Appointment of *G. James Alaback* to the position of director of engineering for the St. Joseph division of Whirlpool Corp., was announced by Glenn A. Evans, division general manager.

H. T. Anderson, director of sales, Preway, Inc., was elected vice president in charge of sales at a meeting of directors recently. Anderson, in charge of sales since June of last year, has served the company as salesman, sales promotion manager, and field sales manager since joining the firm in 1950.

ALABACK

ANDERSON

W. A. Tweedie has been named manager of programming for Temco Aircraft Corp., heading a new department which will coordinate the company's current $2,500,000 building and corporate planning schedule.

Roy A. Bradt recently announced his forthcoming retirement as vice president in charge of marketing of The Maytag Co., Newton, Iowa, effective Sept. 1, 1957, after more than 41 years of service. Although retiring this fall, Bradt will serve out his term as a member of the firm's board of directors.

Bradt, who saw Maytag grow from relative obscurity in 1916, when he started work in the company's machine shops, to world leadership in the home laundry appliance industry, is retiring under provisions of the company's retirement program.

Fred Maytag II, company president, in commenting on Bradt's forthcoming retirement, said, "We owe him a deep debt of gratitude for the major role he has played in the growth of the company. No one more richly deserves to enjoy the well-earned rewards of a lifetime of service."

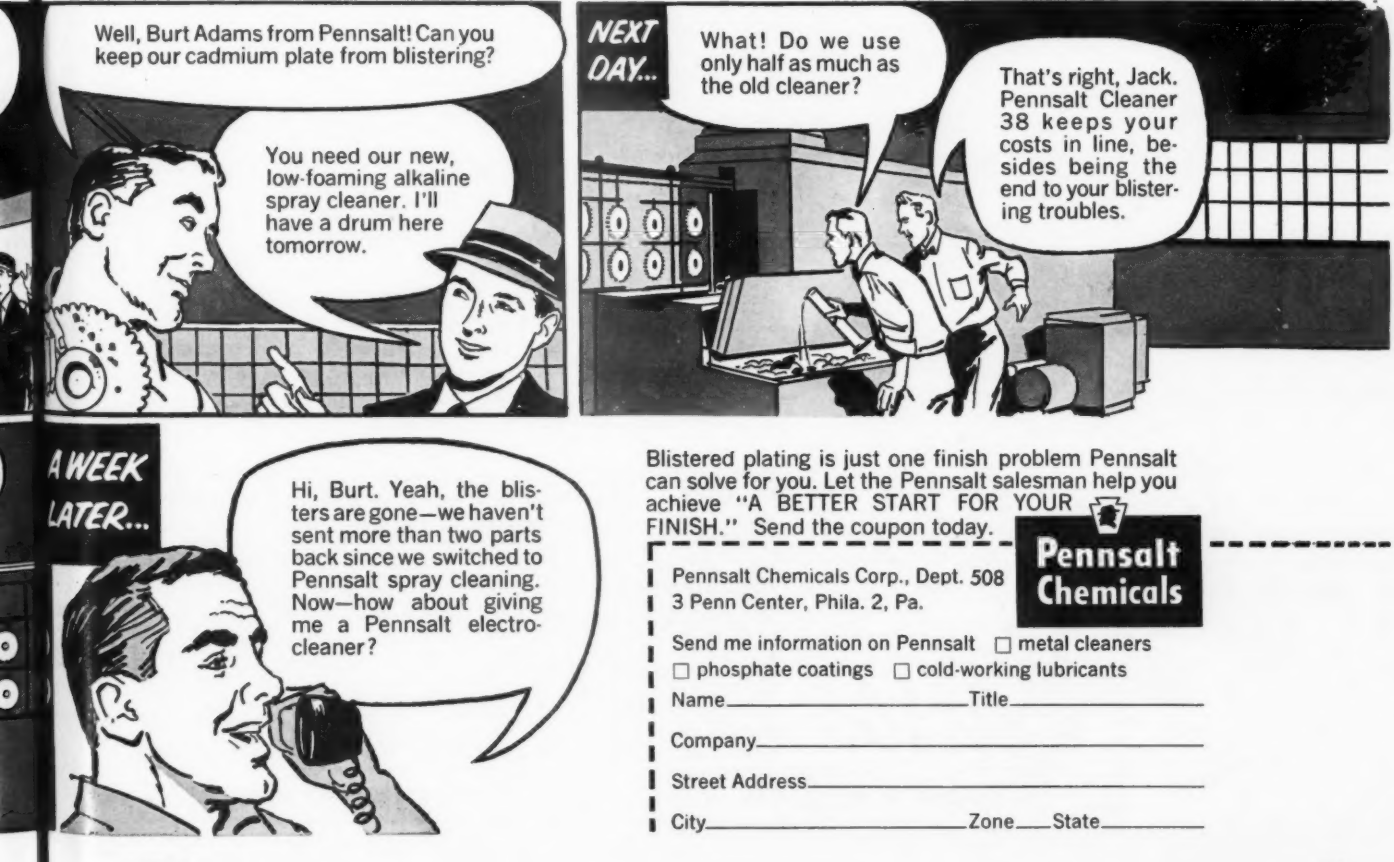
Claire G. Ely has been elected vice-president in charge of marketing for the Maytag company, effective Sept. 1, to succeed Roy A. Bradt, retiring as vice-president on that date. The action was taken this week by the board of directors of the appliance manufacturing firm.

The board of directors also passed a resolution commending Bradt, who has had more than 41 years of employment with the company. The resolution said, in part, "Roy Bradt's record of outstanding service, both to his company and his community, local and national, is one of which he and we are proud, and his termination of active service with the company is accepted with regret."

BRADT

ELY

Earle M. Jorgensen, Los Angeles, was elected a director of Rheem Mfg. Co. at a recent meeting of directors. He is president of the Earle M. Jorgensen Co., steel distributors. He is board chairman of Baker Steel and Tube Co., Los Angeles, and is a director and member of the executive committee of Northrop Aircraft, Inc., Hawthorne, Calif.


Well, Burt Adams from Pennsalt! Can you keep our cadmium plate from blistering?
You need our new, low-foaming alkaline spray cleaner. I'll have a drum here tomorrow.
NEXT DAY...
What! Do we use only half as much as the old cleaner?
That's right, Jack. Pennsalt Cleaner 38 keeps your costs in line, besides being the end to your blistering troubles.
A WEEK LATER...
Hi, Burt. Yeah, the blisters are gone—we haven't sent more than two parts back since we switched to Pennsalt spray cleaning. Now—how about giving me a Pennsalt electrocleaner?

Blistered plating is just one finish problem Pennsalt can solve for you. Let the Pennsalt salesman help you achieve "A BETTER START FOR YOUR FINISH." Send the coupon today.

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Send me information on Pennsalt ☐ metal cleaners
☐ phosphate coatings ☐ cold-working lubricants

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for new and better glass products — whether it be today or 2000 A.D. — Marsco's craftsmen engineering team will develop them.

The Junior Spaceman above has the best in interplanetary protection — a glass space helmet — because glass can be bowed to fit any desired shape and yet it can be tempered to impart extreme resistance to impact.

You or your family don't need space helmets today but chances are glass could improve the utility and beauty of your product and make it more salable today.

Let Marsco's craftsmen engineering team impart to your product all the advantages of glass.

Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:

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MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.

Editor's mail → *from Page 25*

liked Close article

Gentlemen: Please send me a copy of the May issue of Metal Products Manufacturing, containing Mr. Gil Close's article on Chemical Milling. Thank you.

Marvin Harrington
The Barber-Webb Company, Inc.
Los Angeles 58, California

Ed. Note: In answer to your request of May 13, we are enclosing a copy of our May issue of METAL PRODUCTS MANUFACTURING containing Mr. Close' article on chemical milling.

a new reader

Gentlemen: I just recently had the opportunity to look through a copy of your publication METAL PRODUCTS MANUFACTURING, and should like to have my name placed on your mailing list.

A. P. Hoover
General Manager
Brantly Helicopter Corp.
Frederick, Oklahoma

information on spraying

Gentlemen: On page 39 of your May issue, you show a ceramic spray coating operation that apparently was exhibited at the Western Metal Exposition. If possible, I would like to know the manufacturer of the equipment. Thanks a lot and best personal regards.

W. A. Barrows, President
The Fusite Corporation
Cincinnati 13, Ohio

important corrosion factors

Gentlemen: If available, we would appreciate about a dozen copies of your article, "Important corrosion factors in home laundry equipment" by E. E. Bryant. This appeared in your May, 1957 issue.

We feel this article may be informative, not only for our own organization, but in some of our export areas that use extremely hot water which results in early etching of vitreous enamel.

E. O. Morton, Manager
Laundry Engineering Department
Westinghouse Electric Corp.
Mansfield, Ohio

Ed. Note: Your twelve copies have been mailed. There is indication of keen interest in this subject and we're glad to be of help in answering your request.

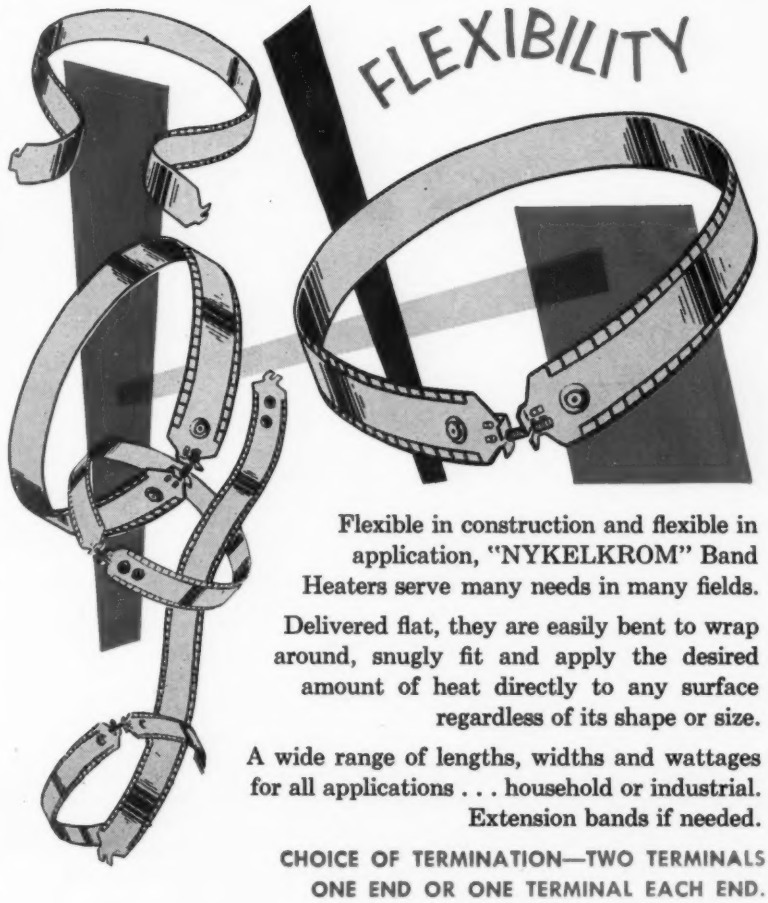
liked marketing article

Gentlemen: I liked Gordon J. Lippincott's article "Confusion in the Market Place", but I don't think he went far enough. I ask you and Mr. Lippincott (pity the poor consumer when he's window shopping or browsing) — how can he tell a washer from a dryer, a water heater from a water softner, — or a range from any table top models of any of the above. As manufacturers we, our distributors and dealers all recognize these products readily, but Mr. Consumer, who only buys these products once in several years, has no need or reason to keep pace with looks, design, etc.

Why are manufacturers so reluctant to say by marking, by display, or by any other means *what* their product is. Note that in the nine pictures in your article only one shows or indicates that the article is a vacuum cleaner. Don't be too quick to tell me that displays always name the product and *what it is*. You'll be surprised to note the number that merely give the manufacturer's name — the viewer has to guess what the product is or possibly read some fine print.

Base kitchen cabinets, counter height water heaters, dryers, washers, dishwashers, ranges, gas and/or electric incinerators, and perhaps numerous other products all seem so similar in appearance, I imagine John J. Consumer must have an exasperating time knowing what he's viewing.

Jim Donnelly
A. O. Smith Corporation
Milwaukee 1, Wisconsin



Flexible in construction and flexible in application, "NYKELKROM" Band Heaters serve many needs in many fields.

Delivered flat, they are easily bent to wrap around, snugly fit and apply the desired amount of heat directly to any surface regardless of its shape or size.

A wide range of lengths, widths and wattages for all applications . . . household or industrial. Extension bands if needed.

CHOICE OF TERMINATION—TWO TERMINALS ONE END OR ONE TERMINAL EACH END.

Write for specification sheet on standard sizes available. Special sizes and construction upon request.

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Tuttle of Adrian

TUTTLE ELECTRIC WINS GENERAL ELECTRIC AWARD

Tuttle Electric Products, Inc., of Kirkland, Illinois, has just been presented the first "Outstanding Supplier of the Month" plaque by the Home Laundry Dept. of General Electric Co., Appliance Park, Louisville, Ky. The title "Outstanding Supplier of the Month" for the Home Laundry Dept. is awarded to the supplier who has made the outstanding contribution through cost reduction on value analysis activity during the current month.

The presentation was made in the Value Analysis Room in Appliance Park by H. B. Miller, general manager of the Home Laundry Dept., to D. V. Tuttle, president of Tuttle Electric Products, Inc.

In photo, from left to right, are: D. V. Tuttle; V. E. Mallrich, G.E. buyer; E. L. Munson, G.E. purchasing agent; D. H. Rohrer, G.E. materials manager; H. B. Miller; W. R. Seeley, vice president sales for Tuttle; and B. W. Hines, Tuttle sales engineer.

NORTHWEST CHEMICAL APPOINTS WEST COAST LICENSEE

Northwest Chemical Co., Detroit, Mich., has licensed the Alert Supply Co., Los Angeles, Calif., to manufacture the Northwest line of specialized cleaning compounds. They have sold Northwest products for the past four years to West Coast industries. The company will operate from a newly-completed warehouse and factory which has been equipped with modern mixing machinery.

RAYBESTOS-MANHATTAN BUILDS ADHESIVES LABORATORY

A new laboratory has been constructed by Raybestos-Manhattan, Inc., at its plant in Stratford, Conn., for the development and testing of the line of thermosetting and thermoplastic adhesives, coatings, and sealers made by its Adhesives department for industrial applications.

The new laboratory is equipped with tensile machines for shear and peel tests, ovens for testing up to 600 degrees, pilot mixers, salt spray testing cabinets, and humidity testing area. The latter permits testing the drying time and other properties of adhesives under varied climatic combinations.

MICHIGAN OVEN CO. ADDS TWO NEW REPRESENTATIVES

A. C. Towne, Jr. president of Michigan Oven Co., Detroit, Mich., manufacturers of industrial oven systems, announced two additions to the company's distributor group: M. D. Brandwine Equipment Co., St. Louis, Mo.; and William J. Boschert, Brandwine Equipment Co., Kansas City, Mo.

COWLES' DAVIS RETIRES

Fred C. Davis, production manager, and manager of Cowles Chemical Company's Lockport, N. Y. plant, is retiring after more than 50 years of service, it was announced recently by R. F. Huntley, president. Davis will be succeeded by N. E. Woonton, recently-elected vice president, manufacturing.

Davis started his career with Cowles working during school vacations from 1903 until 1907, when he became regularly employed. In 1930, he succeeded his father, the late F. J. Davis, as superintendent and manager of Cowles' plant at Lockport, N. Y.

GULTON DEVELOPS MICROWAVE ABSORBING MATERIALS

Development of absorbing materials for microwave applications has been announced by Gulton Industries, Inc., Metuchen, N. J. Known as Glennite Microwave Absorbing Materials, they are designed for application where radiating microwave equipment has to be aligned or tested in restricted spaces. Of the two classes of Glennite materials, one is wide band, while the other utilizes the interference principle. They feature low reflectivity and high absorption at centrimetric wave length for use in dark room and other screening purposes, and the elimination of unwanted permanent echoes encountered in such areas as air field and harbor installations.

ATLAS MINERAL OPENS NEW PITTSBURGH BRANCH

The Atlas Mineral Products Co., Mertztown, Pa., has recently opened a new Pittsburgh Branch Engineering office, according to an announcement by Joseph A. Snook, president. The new office, located at 5907 Penn Ave., Pittsburgh, has been designed specifically to service the steel and metalworking industry, and will function also as a service center. The office will be in charge of Thomas K. Piper, who was recently appointed engineering manager.

AIRESEARCH PHOENIX EXPANDS FACILITIES

Expansion of electronic and pneumatic control facilities at The Garrett Corporation's Airesearch Manufacturing division in Phoenix, Arizona, totalling 40,000 square feet of working area, was completed last month, according to Murray S. Gelber, vice president and manager of the Arizona division.

The construction, which is in addition

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5211

to the half million footage already in operation by the Garrett division, will house 500 workers engaged in the company's electronic and valve business.

SAFETY AWARD TO COWLES

Cowles Chemical Co., Skaneateles Falls, N. Y., has been presented an award for completing one quarter million man-hours with accident frequency rate less than 50 per cent of the average for the chemical industry. The presentation was made at a special safety meeting of all Cowles production, research, and engineering personnel at the Skaneateles Falls location.

Robert F. Huntley, right, president of Cowles Chemical Co., receives award for safety accomplishment from William Douque, manager, Employers Mutual Liability Insurance Co. of Wisconsin.

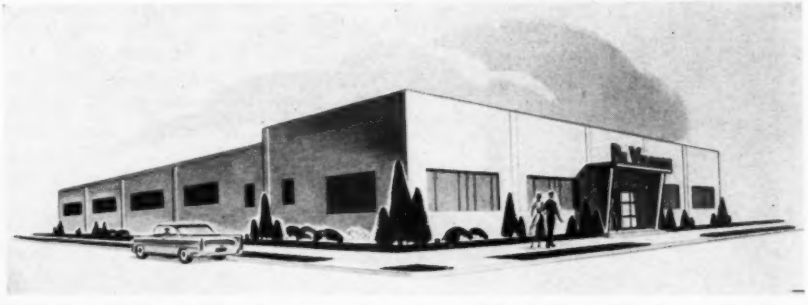
WESTINGHOUSE SHIFTS WATER HEATERS TO COLUMBUS PLANT

Production of electric water heaters has been shifted to the Westinghouse Columbus plant from Mansfield, Ohio. John W. Craig, vice president and general manager of the Electric Appliance Divisions said production is already underway on the new assembly line.

DEVILBISS MOVES N. CALIFORNIA BRANCH

In another step to provide better service for its West Coast area customers, the DeVilbiss Co., Toledo, Ohio, has announced recently that it will shortly move its direct factory branch facilities for Northern California from Santa Clara to San Jose. The move follows on the heels of the establishment of new branch facilities in Los Angeles to serve Southern California and Arizona, the establishment of enlarged sales-service headquarters in Seattle for the Pacific Northwest, and at Salt Lake City for the Inter-Mountain area.

Full facilities for sales, service, engineering, repair and exchange, and inventory will be maintained in the new building.



New Northern California headquarters of the DeVilbiss Co. in San Jose. Facilities for sales, service, engineering, repair and exchange, and inventory will be maintained. Building will have more than 10,000 square feet of floor space.

ALUMINUM PROTECTS 5-1/2-MILE PIPELINE

A new steam-carrying pipeline system that is protected from rain, snow, dirt, and ice by a corrosion-resistant aluminum jacket, now is in operation at Esso Standard Oil Company's Bayway refinery.

The aluminum application, one of the largest of its type, employs 80,000 pounds of alloy 3003 sheet produced by Aluminum Co. of America. It shields five and one-half miles of large diameter, insulated steel pipe from damaging weather and a corrosive industrial-marine atmosphere.

TUBE REDUCING APPOINTED AGENT FOR NIPHOS PROCESS

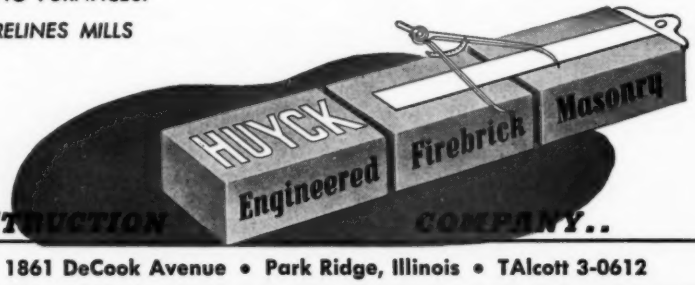
A. J. Williamson, president of Tube Reducing Corp., Wallington, N.J., announced recently that the firm has been appointed exclusive licensee for the manufacture and application of the newly-developed Niphos corrosion protection coating for ferrous metals. Originated and perfected by the New York Testing Laboratories, the Niphos process is, in essence, a low-cost method of applying nickel alloy to mild steel to prevent corrosion and impart many of the essential characteristics of stainless steel to ordinary mild steel.

WYANDOTTE TO GET NEW DIAPHRAGM CELL

A 30,000-ampere rectangular diaphragm cell, developed by Diamond Alkali Co., Cleveland, Ohio for the electrolytic production of chlorine and caustic soda, will be installed at the $20-million Geismar, La. chlor-caustic plant of Wyandotte Chemicals Corp., Wyandotte,

HUYCK *FURNISHES FIREBRICK MASONRY TO BUILD, REBUILD AND REPAIR ALL TYPES OF: ENAMELING FURNACES . . . FRIT SMELTERS . . . ALUMINUM, BRASS, LEAD SMELTERS . . . FORGE FURNACES . . . HEAT TREATING FURNACES.*

HUYCK *LINES AND RELINES MILLS*



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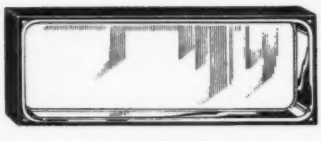

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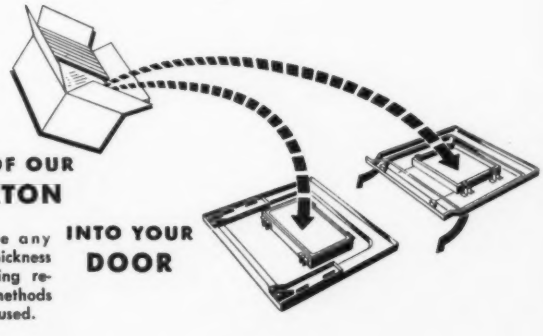
The strong steel encased, double pane PERMA-VIEW window incorporates the finest quality heat resisting glass. It is mechanically sealed to prevent infiltration of vapors and to eliminate "fogging." This "No-Fog" window meets the constantly growing demand for "visible baking."

The PERMA-VIEW window is pre-engineered, and comes to you ready for immediate installation in your range — "out of our carton into your door." Let our specialized production lines serve as a part of your sub-assembly facilities. Phone or write us for complete details on the ease and economy of adding this sales feature to your new ranges.



We can manufacture any shape, any size, any thickness to meet your engineering requirements. Alternate methods of attachment may be used.

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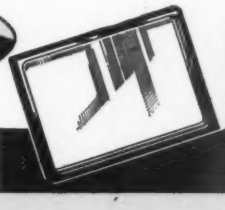

MILLS PRODUCTS INCORPORATED

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Mich. The announcement was made by Frank Chrencik, general manager of Diamond's Electro Chemicals division.

The two chemical producers have signed a license agreement, Chrencik said, whereby Diamond will provide Wyandotte with engineering know-how, design, assembly, and operational data covering the construction, operation, and maintenance of the Diamond 30,000-ampere diaphragm cell at Wyandotte's Geismar facility.

BARRETT TO DOUBLE MELAMINE RESIN OUTPUT

Expansion plans which will more than double Plaskon melamine and urea molding compound production facilities in Toledo have been announced by Barrett division, Allied Chemical & Dye Corp. Scheduled for completion by mid-1959, the expansion will make the Toledo facilities one of the largest thermosetting resins plants in the country.

Plaskon thermosetting materials are used for stove and refrigerator parts, electrical wiring devices, electrical appliance components, etc.

ALLEGHENY LUDLUM OPENS NEW PLANT

The Carmet division of Allegheny Ludlum Steel Corp. has begun operations in a new plant at Bad Axe, Mich., according to an announcement. The plant, to produce cemented carbide tools, will receive its raw material from the Carmet parent plant in Ferndale. Operations began with the start-up of two milling machines, which are used for the shaping of the steel shanks prior to the heat treating operation. Other operations to be performed at the new plant include drilling, sawing, degreasing, grinding, etc.

NATIONAL LEAD EXPANDS NICKEL PRODUCTION IN CUBA

National Lead Co. announced the completion of a 75-per cent expansion program at the U. S. Government-owned nickel producing facility at Nicaro, Cuba. Nickel Processing Corp., a subsidiary of National Lead, operates the plant for the Government. The expansion will bring rated capacity to 50 million pounds of nickel per year.

Original estimates for the expansion called for a cost of approximately $43 million. However, the project will be completed for about $37 million, or $6 million under the estimate, the report states.

STEELMAKING TO BE SHOWN AT CHICAGOLAND FAIR

Steelmaking in Chicago will be dramatized at the Chicagoland Fair by Inland Steel Co. The company has built for the Fair miniatures of the furnaces and mills that produce steel in its Chicagoland plant, described as the world's fourth largest. The fair is being held at Chicago's Navy Pier June 28-July 14.

Visitors to the exhibit will see how Great Lakes steamers bring together the raw materials of steel, how ore is smelted in towering blast furnaces into iron, and how the iron is refined into steel in fiery open hearth furnaces and then rolled into the multiplicity of forms and shapes which make steel the most useful of all metals.

The model maker's art has been employed to reproduce the furnaces and rolling mills diagramatically with cutaway sections which enable the viewer to see the inside workings of the vast equipment.

Picking up a telephone, the viewer can listen to an explanation of the processes which go on before his eyes, the flow of colored light marking the movement of the metal in the making as it glows gray to rosy to white hot, then cools to workable forms as it finally takes the familiar shape of useful steel products.

From a steel mill "Pulpit" or control room, the visitor to Inland's exhibit can "Roll his own" steel slab.

NEW CRUCIBLE STEEL OFFICES AND DISTRIBUTION CENTER

Ground has been broken for the new 75,000-square foot warehouse-distribution center and sales and administration offices for the Crucible Steel Co., Salem, Ohio. The center will increase and facilitate the distribution of tool, stainless, and other specialty steels to area fabricators, the report states.

The office area of the new building wil depict the functional and decorative uses of stainless steel in architectural design. Both railroad cars and trucks will come into the center of the warehouse area, enabling one set of cranes to serve for unloading rail cars, storing steel, and loading trucks.

PARKER RUST PROOF OPENS NEW AUTOMATED LABORATORY

Parker Rust Proof Co., Detroit, Mich., has announced the opening of an automated "production line" laboratory for the treatment of metal surfaces. Developed at a cost of $300,000, the laboratory features two large automatic "test tubes" — special machines which can make actual production tests in the use of chemical coatings for the prevention of corrosion, as a paint base, and as aids in cold forming.

Any problem pertaining to metal surface treatment can be handled at the new laboratory, according to M. B. Roosa, vice president, sales. In the event a metal fabricator planned to add a new product, or convert to automation, Roosa explained, he had only to send enough stock or parts for a full production test run to the laboratory.

Key steps in automatic metal surface treatment are shown. The workman is checking concentrations of chemicals which are being applied by sprays and rollers in a continuous operation. Various applications protect metal stock against corrosion, provide a base for anchoring a paint finish, and treat metal for cold forming operations. After being treated under the same conditions that would be necessary in a factory or steel mill production line, the strip or sheet stock passes through the drying oven at right.

Big things *are happening in* porcelain enamel plumbing fixtures

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SUPPLIER PERSONALS

James O. Clevenger has been named general manager of the Bryant Electric Company, wholly-owned subsidiary of the Westinghouse Electric Corporation.

Clevenger was formerly sales manager for Westinghouse general products in Pittsburgh. At Bryant Electric he succeeds *L. N. Goodell*, who has been named manager of the electrical products department of the Westinghouse Sunnyvale manufacturing division at Sunnyvale, Calif.

Harry C. Emberson, president, Century Vitreous Enamel Co., Chicago, has announced the addition of *Leonard Windmiller* to the technical staff. Windmiller will report directly to Roger Fellows, vice president.

The appointment of *C. E. Geary* as manager of advertising and sales promotion for General Electric's Direct Current Motor and Generator department, Erie, Pa., has been announced by Paul D. Ross, marketing manager.

The board of directors of Robertshaw-Fulton Controls Co. announced recently the election of *Thomas T. Arden* as president. He has held the position of executive vice president since 1947.

Frank N. Capparelli has been appointed factory representative for Illinois for the Chicago Rubber Co., Waukegan, Ill. *James E. Belanger* becomes the Michigan representative.

ARDEN

CAPPARELLI

Appointment of *Robinson F. Barker* to the new position of vice president of the glass division has been announced by Pittsburgh Plate Glass Co., Pittsburgh, Pa.

Raymond A. Quadt has been named director of research and development for the Bridgeport Brass Co. it was announced by Herman W. Steinkraus, president and chairman of the board.

Harold E. Hole has been appointed district sales manager of Scovill Mfg.'s Rochester office, and *Robert A. Nielson* has been appointed sales manager of Rod and Wire Mill Products, Brass Mills Div.

Charles R. Wirshing has been named metalworking chemical sales manager, West Coast district, according to an announcement by Gerald C. Romig, president of the American Chemical Paint Co., Ambler, Pa. Wirshing became a member of the ACP sales staff, in Detroit, ten years ago, and was transferred to Niles, Calif., in 1952.

William L. Wallace has been appointed assistant to the executive vice president of Alloy Precision Castings Co., Cleveland, Ohio, it was announced recently by Frank W. Glaser, executive vice president and general manager.

Woodman Perine, director of Vitro's Silver Spring laboratory, Md., has been elected to the new office of president of Vitro Engineering Co., a division of Vitro Corp. of America, according to an announcement by J. Carlton Ward, Jr., Vitro president. Perine replaces Richard A. North, general manager of Vitro Engineering division since 1954, who has resigned.

Walter L. Robinson has been appointed quality control manager for Pheoll Mfg. Co., Chicago, according to an announcement by William T. Vivisaker, vice president and general manager of the Commercial division.

Norman A. Spector, vice president of Heavy Minerals Co., and assistant manager of Vitro Engineering division, has been named vice president of Vitro Corp. of America, according to an announcement by J. Carlton Ward, Jr., president.

The Solar Steel Corp. announced recently from their general offices in Cleveland, Ohio, that *Arthur W. Miller* has been appointed sales manager of the area served by Solar's Nashville plant.

George H. Williamson has been elected vice president in charge of West Coast activities of the American Chemical Paint Co., including the ACP plant at Niles, Calif.

Howard W. Holtz has been appointed to the position of assistant dealer sales manager, according to an announcement by David J. Broderick, vice president, Walter E. Selck and Co., Chicago.

Edward H. Rofe has been appointed chief engineer of Sahlin Engineering Co., Inc., manufacturers of press unloaders and other automation equipment, it has been announced recently by Richard T. Sahlin, president. Rofe has been associated with Sahlin since 1953. Previously, he was employed by Fisher Body Division, General Motors Corp.

HOLTZ

ROFE

Ellsworth A. Stockbower has been appointed manager of new product sales in the Metalworking Chemicals division of the American Chemical Paint Co., Ambler, Pa., it has been announced by G. C. Romig, president of the firm.

Frank M. Mansfield III, formerly manager of product planning and market research for General Electric's metallurgical products department, Detroit, has been named sales manager and vice president for Wagner Brothers, Inc., producers of plating equipment and supplies, also of Detroit.

Reuven N. Platt has been promoted to assistant sales manager for the states of Illinois and Michigan by Rolled Steel Corp., Skokie, Ill., it was announced by Scott Burton, vice president in charge of sales. The company distributes sheets, bars, plates, and structural steel products.

Theodore E. Hart has been appointed secretary-treasurer of Alloy Precision Castings Co., Cleveland, Ohio, it has been announced by Frank W. Glaser, executive vice president and general manager.

J. C. Smith has been appointed plant manager of the Bowling Green, Ky., plant of Detrex Chemical Industries, Inc., according to an announcement by R. A. Emmett, Jr., vice president and works manager.

Marcus M. Chapman has been elected vice president, sales division, United States Steel Corp., it has been announced recently.

to Page 90 →

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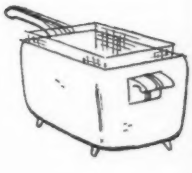

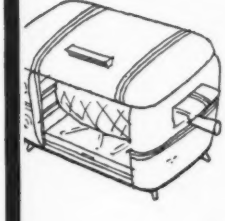

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Eighth annual appliance technical conference

(Continued from Page 58)

sented the results of extensive research work in the field of appliance load studies. Particular attention was given to Ranges, Clothes Dryers and Water Heaters.

Water heater standardization

Mr. Milby reported that the utilities are attempting to standardize requirements for electric water heaters to ease the demand on the manufacturers for an endless variation in the manufactured products.

Statistical data presented was based largely on winter load conditions but it was stated that Detroit Edison also has a report available (on request) covering summer loads during summer air conditioning season.

The closing paper at the Tuesday morning session was by A. B. Marmo, Westinghouse Electric Corp., and was entitled "Some Fundamental Considerations in Drying of Clothes." The data presented by Marmo was based on "eight hours per day for five months" actual clothes drying tests.

According to this speaker, the extensive data developed through these and other testing programs tended to prove that the conventional drying theories adhered to in the past may be obsolete.

Appliance Controls

The closing session on Tuesday afternoon, May 21, included four excellent papers. They were: "Recommended Standards and Procedures for Solenoids" by I. Gebel and D. O. Myers, Controls Company of America (presented by Mr. Myers); "Appliance Thermostat Applications" by D. J. Schmitt, Therm-O-Disc, Inc.; "Washer-Dryer Control System" by A. M. Stone and M. F. Metzger, General Electric Co. (presented by Mr. Stone); and "Sequential Timers-Designs and Trends" by A. R. Constantine, consultant for Kingston Products Corporation.

Myers discussed solenoid characteristics and procedures and techniques for obtaining repeatable results together with a recommended method for presenting data.

Schmitt cautioned engineers to watch override temperatures in appliance design for he said "They govern selection of type of materials used in the thermostat," The probable life cycle of the component should be given close consideration. A coffee maker, for instance, operated three times a day for approximately 1,000 times a year would indicate that 100,000 cycles is adequate. To specify 200,000 means a more costly unit to no advantage.

Stone, through an excellent set of illustrations, showed components and cycling sequence for a modern combination washer-dryer. He demonstrated how the completely automatic appliance requires more ingenious circuits and more and better control components,

Constantine, through a series of drawings, showed the development of sequential controls. He demonstrated how circuits have become increasingly complex without comparable increase in size of the component. He stressed the importance of practicability as well as ingenuity in appliance component design.

Discuss broader scope for future conference programs

Both D. C. Krammes, program chairman, (Hoover Company) and B. F. Parr, (Westinghouse) in a discussion of the aims of the Domestic Appliance Subcommittee referred to the desirability of broadening the scope of future Appliance Technical Conference programs.

T. H. Cline presides at session II.

At a meeting of key subcommittee personnel and representatives of the appliance industry press, consideration was given to encouraging other recognized associations with technical divisions or committees to participate in future programs.

As was indicated, the average appliance plant is interested in mechanical, chemical, ceramic and other engineering phases in addition to electrical. The current plan open to future development is to invite participation by the engineers from other recognized organizations in the appliance industry.

Current plans call for holding next year's Appliance Technical Conference in Chicago at the Morrison Hotel.

OVER 18,000 ATTEND DESIGN ENGINEERING SHOW

The official attendance at the Design Engineering Show held at the New York Coliseum from May 20 thru 23 was 18,200. Some 371 companies exhibited thousands of products at the four day show. The show was highly successful in the eyes of the exhibitors interviewed by the MPM representative.

The Machine Design Division and Metropolitan Section of the American Society of Mechanical Engineers sponsored the Second Design Engineering Conference in conjunction with the show. The Conference lasted three days, from May 20 thru 22. On Monday, May 20th, the opening session covered the subject of "Procedures in developing new designs". This was a question and answer panel session, including questions from the floor. Included in the eight man panel were such men as T. M. Butler, director of engineering, Burroughs Corp.; George F. Habach, vice president, engineering, Worthington Corp.; and William J. Russell, vice president engineering, Landers, Frary & Clark.

On both Tuesday and Wednesday a mechanical session, a materials session, and an electrical session were held concurrently. An excellent group of speakers participated in all sessions. The conference set a new attendance record of 1,750.

The final function of the conference was the American Society of Mechanical Engineers banquet held at the Hotel Sheraton-Astor. The speaker was William F. Ryan, president, The American Society of Mechanical Engineers; vice president and senior consulting engineer, Stone and Webster Engineering Corp., Boston, Mass.

Supplier Personals

→ *from Page 88*

Samuel A. Glueck, former general manager of the Eastern department of Federated Metals division, American Smelting and Refining Co., has been named general manager of the Midwestern department. *Louis D. Alpert*, manager of Federated's Los Angeles plant, has been appointed general manager of the Eastern department.

John A. Mowrer has been named equipment product manager, Western region, for Kelite Corp., Berkeley Heights, N.J., manufacturers of steam cleaning equipment and industrial chemicals.

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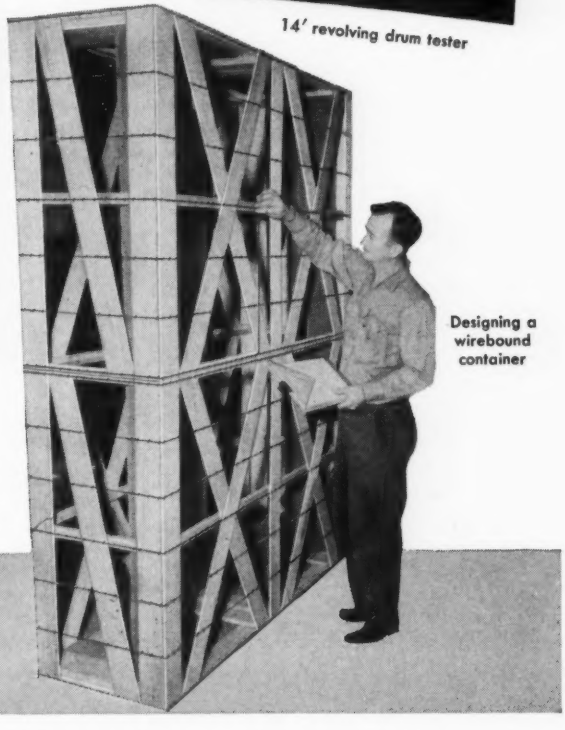
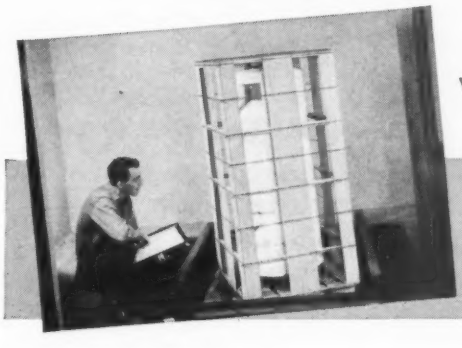
Incline impact tester

14′ revolving drum tester

Drop tester and 7′ revolving drum tester



Designing a wirebound container



Vibration tester

General Box behavior clinic for shipping containers

When General Box designs and tests a container for your product, there's little room left for guesswork about its behavior. Some of the reasons are illustrated above. How it will handle in your plant, how it will pack, how it will ship, and how it will arrive and unpack are all considered.

General Box design engineers know the importance to you of every possible saving in packing, shipping, and direct container costs. And every month they design containers for all kinds of things—machine tools that weigh several tons . . . "hard to pack" products like radar antenna . . . major appliances . . . component parts in bulk.

Whether you believe the best container for your product will be a toughie or a snap to design, it will pay you to find out what the General Box answer is. It's easy to do—just let us send a man. No obligation. Write for your copy of the "Heavy Duty" issue of "General Box."

Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

Engineered Containers for Every Shipping Need

Wirebound Crates and Boxes • Generalift Pallet Boxes • Corrugated Boxes • Corrugated Containers • All-Bound Boxes • Stitched Panel Crates

General Box

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safe transit

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DANA CHASE PUBLICATIONS
York Street at Park Avenue
Elmhurst, Illinois

editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

SIGN FOR FREIGHT CARS REDUCES DAMAGE

Pemco Corp., Baltimore, Md., leaves few stones unturned in its work to improve freight movement, and to lower costs for the benefit of customers, competitors, as well as for itself.

Although the company has reduced the average damage claim for freight cars by 49 per cent in the last three years, Pemco decided to take further steps, besides its constant study of freight car loading procedure, to reduce freight car damage to the product still further. Pemco ships its porcelain enamel and glaze frits in 100-pound multi-wall paper bags which, however sturdy, can be damaged through careless unloading.

A large yellow card, 13 inches wide by 11 inches deep, is stapled inside each freight car that leaves the factory. An illustration on the sign features a bathing beauty model holding one of the 10-pound bags, and the headline says, "Thanks, Mr. Unloader. . . Your care in unloading this freight car is appreciated!" The copy then goes on to ask the unloader to return the business reply card which is fitted into die-cut slots in the sign. Basic information is filled out on this "Arrival Condition Report" card by Pemco, and the customer's receiving department has but to check the card to indicate that the load arrived satisfactorily. If any bags were broken or the load shifted, the customer can check off the information.

This large yellow card 13" x 11" is stapled to the wall of each freight car leaving Pemco Corp., Baltimore, Md. An "Arrival Condition Report" reply card is tucked into slots in the sign for continuing study. Unloading tips reduce chance of damage.

Thanks, Mr. Unloader...
YOUR CARE IN UNLOADING
THIS FREIGHT CAR IS APPRECIATED!
Please fill in and return the attached Arrival Condition Card today- it helps us give you better service.
--PLEASE MAIL TODAY--
UNLOADING TIPS:
PEMCO CORP., BALTIMORE 24, MD.

VANANT APPOINTS NEW SALES ENGINEER

John C. Gockley has been appointed to the newly-created position of sales engineer for the Vanant Co., Milwaukee, manufacturers of Sus-Rap packaging materials. This is part of Vanant's new sales expansion program.

Gockley has been associated with the paper industry for nine years in sales and development capacities, working out of his Quincy, Mass., office. He will assist manufacturers in the Northeastern states with their packaging problems.

Sus-Rap is a wrap-around strip of individual width designed to simplify the packaging process and reduce handling and shipping costs. It is engineered for each application, and provides both horizontal and vertical suspension within the carton.

FORT WAYNE CORRUGATED EXPANDS CHICAGO PLANT

The Chicago plant of Fort Wayne Corrugated Paper Company will be increased in size 27 per cent, according to an announcement by V. I. I. Kegerreis, Chicago division manager of the Fort Wayne corporation.

Kegerreis, who made the announcement in Division headquarters at 4500 S. Kolin Ave., said the expansion program will add 47,700 square feet to the plant, which now has 175,000 square feet of floor space. The Division manufactures a number of shipping containers for major appliance manufacturers.

CLARK OFFERS BROCHURE ON FORK TRUCKS

Engineering specifications, dimensions, and mechanical features of the 5000-lb. capacity gas powered model in the Clarklift line of fork trucks are contained in a six-page, four-color brochure now available from the In-

MANITOWOC FREEZERS
Protect Their Quality

in CHICAGO MILL SHIPPING CONTAINERS!

Protection...

is assured of freezers manufactured by the Manitowoc Equipment Works, Manitowoc, Wisc., — and of *your products*, against Damaged on Arrivals, Hidden Damage Claims, Costly Returns and Customer Dissatisfaction, when shipped in Chicago Mill Containers. 76 years of experience, modern designing and testing, and great diversification are among the reasons Chicago Mill can provide you with economical containers that protect your products from shipping hazards.

Only Chicago Mill *MAKES 'EM ALL!* The Most Diversified Line, utilizing Craveneer, Corrugated, Plywood, Veneer and Resawed Materials!

FREE! *Illustrated catalog describing Chicago Mill shipping containers and services.*

CHICAGO MILL AND LUMBER COMPANY
33 South Clark Street — Chicago 3, Illinois

PLANTS
- CHICAGO, ILLINOIS
- GREENVILLE, MISSISSIPPI
- HELENA, ARKANSAS
- ROCKMART, GEORGIA
- TALLULAH, LOUISIANA

dustrial Truck Division, Clark Equipment Co., Battle Creek, Mich.

Engineering specifications include pertinent data on the engine, power train, automatic Hydratork Drive, hydraulic system, upright assembly, and other components. Charts and drawings indicate operating dimensions such as lifting heights, drawbar pull, and turning radius. Photographs and sketches describe such features as finger-tip control levers, quick take-off counterweight, swing-up hood, and self-adjusting brake.

NEW COMPANY CERTIFICATIONS UNDER SAFE TRANSIT PROGRAM

Recent product manufacturers to be certified under the National Safe Transit Program are as follows: Airosol Co., Inc., Neodesha, Kans.; Westinghouse Electric Corp., Elevator Div., Jersey City, N. J.; All-Steel Equipment, Inc., Aurora, Ill.; American Chain & Cable Co., Inc., Pennsylvania Lawn Mower Div., Exeter, Pa.; Westinghouse Electric Corp., Sturtevant Div., Hyde Park, Mass.; Westinghouse Electric Corp., Kansas City, Mo.; The Hall China Co., East Liverpool, Ohio; UARCO, Inc., Chicago, Ill.; Westinghouse Electric Corp., Micarta Div., Hampton, S. C.; Porter-Cable Machine Co., Syracuse, N. Y.; United Sound & Signal Co., Inc., Columbia, Pa.; Vendorlator Mfg. Co., Fresno, Calif.; Davidson Corp., Brooklyn, N. Y.; Landers, Frary & Clark, Inc., New Britain, Conn.; Kent Plastics Corp., Evansville, Ind.; Allis-Chalmers Mfg. Co., Boston Works, Hyde Park, Mass.; Glascock Mfg. Co., Muncie, Ind.; Stoner Mfg. Corp., Aurora, Ill.; Ritter Co., Inc., Rochester, N. Y.; Esquire Radio Corp., Brooklyn, N. Y.; Geeco, Inc., St. Joseph, Mo.; Westinghouse Electric Corp., Elmira, N. Y.; Westinghouse Electric Corp., Micarta Div., Trafford, Pa.; C. G. Conn, Ltd., Elkhart, Ind.

NEW LABORATORY CERTIFICATIONS

Recently certified Safe Transit Laboratories are as follows: Gaynes Engineering Co., Chicago, Ill.; Bathurst Power & Paper Co., Ltd., Toronto, Ontario, Canada; Mohawk Containers, Inc., New Hartford, N. Y.; Lawrence Paper Co., Lawrence, Kans.

SAFE TRANSIT MEETINGS IN THE SOUTHWEST

R. F. Bisbee, general chairman of the National Safe Transit committee, recently filled a number of speaking engagements in the Southwest United States on behalf of the NST committee. One of the highlights of Bisbee's speaking tour through Texas was the seminar of the Packaging Institute, School of Engineering, Southern Methodist University of Dallas, at which he presented a paper. Others presenting papers at the seminar were: Paul Vogt, GE; R. F. Weber; and C. A. Naffziger, Assn. of American Railroads.

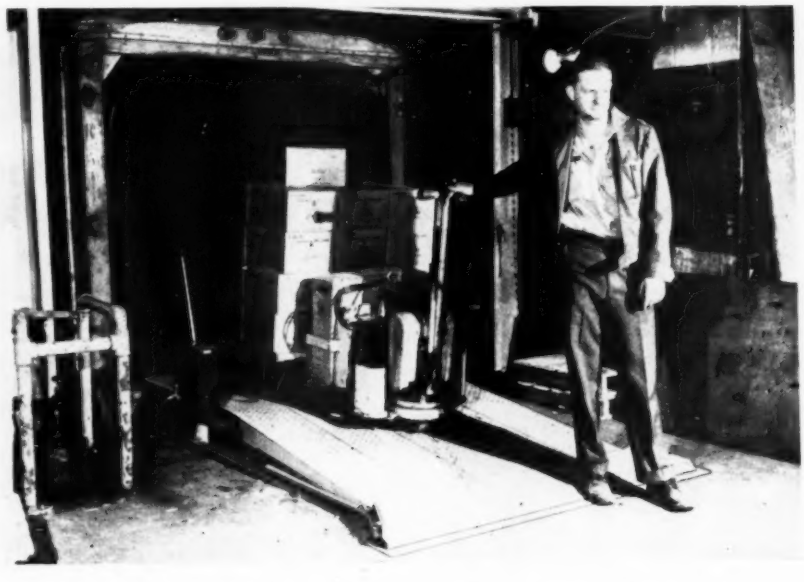
SMU's Packaging Institute was established and originally sponsored by the Southwestern section of the Society of Industrial Packaging and Materials Handling Engineers. The SMU laboratory is certified under the National Safe Transit Program, and represents the first non-profit laboratory set up by a United States university.

In his talk at a meeting of more than 60 carrier representatives, Bisbee emphasized the importance of the Safe Transit label used by certified manufacturers to identify their pre-shipment tested packaged products, and the importance of the "two-way street" — manufacturers and carriers working together to reduce in-transit damages and losses, and to reduce claims.

BUSH SPEAKS AT PACKAGING CONVENTION IN CANADA

P. W. Bush, chairman of NST's Technical Planning division, recently addressed the 1957 Canadian Packaging Convention of the Packaging Assn. of Canada in Toronto. Interest in the National Safe Transit Program continues to grow in Canada among manufacturers, testing laboratories, and carriers, it is reported.

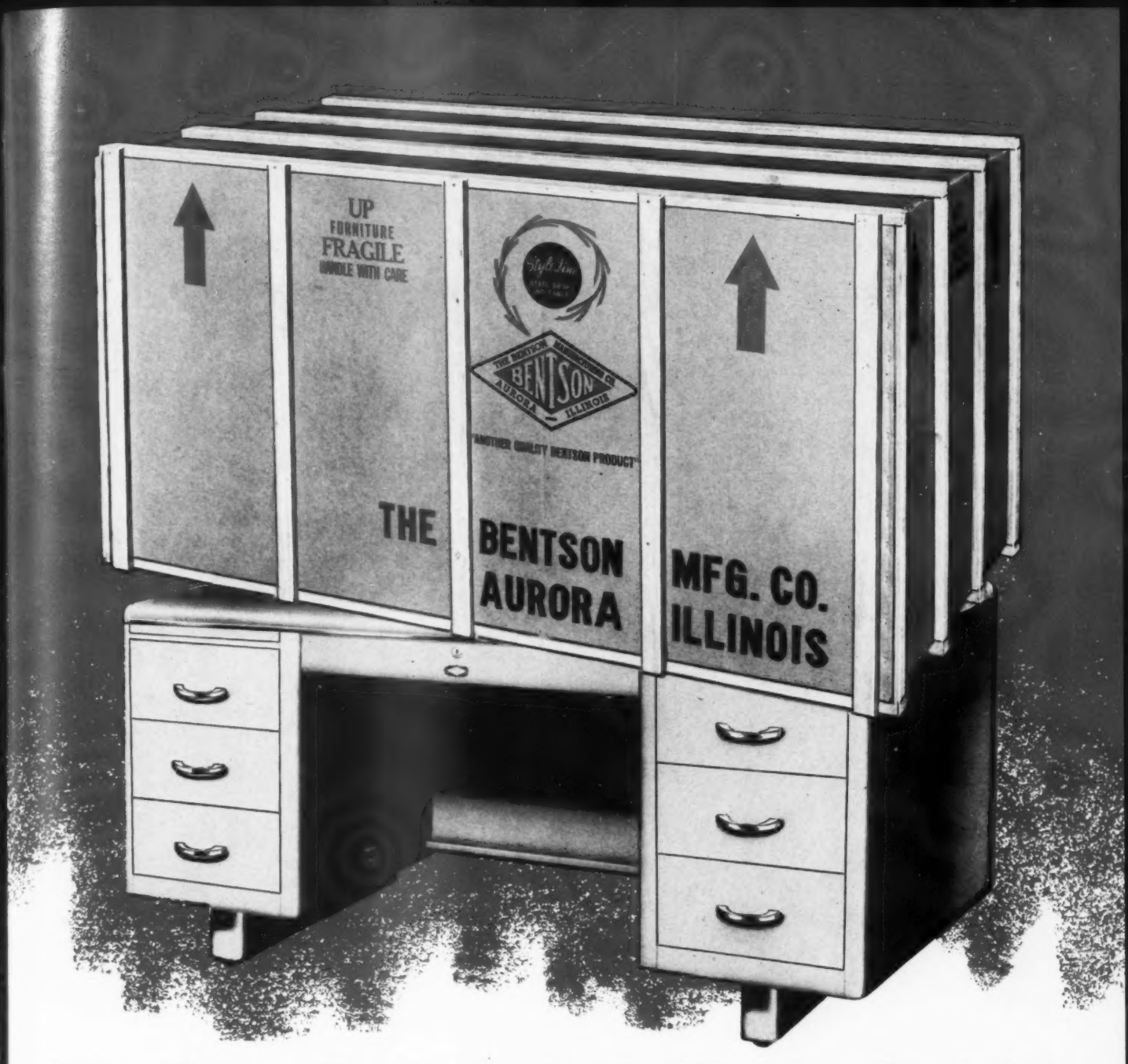
NEW DOCK RAMP HYDRAULICALLY OPERATED



Lite-Line Metal Industries, Division of Copperloy Corp., Cleveland, Ohio, manufacturer of magnesium dock equipment, has just announced a new powered dock ramp. The ramp is especially designed for low docks commonly found in older buildings, i.e., those docks under 48 inches high.

Use of the new ramp eliminates expensive excavations or alterations to the dock. It is simply bolted to the dock surface and can be installed in 30 minutes. In addition, it is unnecessary to space vehicles away from the existing dock edge to provide space for the ramp; thus interference with traffic on the sidewalk or street is avoided.

The Lite-Line Ramp is made of steel and is hydraulically operated. Four motions are provided — the forward edge can be raised or lowered to accommodate truck beds up to 14 inches higher than the dock. An additional feature of the ramp is the 15″ horizontal travel motion provided. This motion permits the ramp to be retracted behind the edge of the dock to prevent damage while trucks are spotted at dock edge. The ramp can also be pulled back to permit closing dock doors. The standard model is five feet wide and ten feet long.



The Finest Products Go In Watkins Containers

They are preferred because of:

1. Low Cost
2. Stacking Strength
3. 75% Assembled—Upon Receipt
4. Ease of Assembly
5. Easy Handling
6. Minimum Storage Space
7. Protection from Dust and Dirt

Custom Protection . . .

THE **WATKINS CONTAINER** MANUFACTURERS

THESE COMPANIES BUILD WATKINS CONTAINERS

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940 E. Michigan St., Indianapolis, Ind.

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KIECKHEFER BOX & LUMBER CO.
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LEWISBURG CONTAINER CO.
[illegible]

LOVE MFG., INC.
P.O. Box 546, Wichita, Kansas

UTILITY CRATE CORPORATION
2019 Imperial St., Los Angeles 21, Calif.

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WANTED. Ceramic engineer to do development work with view to being in charge of expanding research and development department in rapidly growing international company manufacturing new products. $85-$125 per week. Location New England. **Box No. 7-A, Dana Chase Publications, York St. at Park Ave., Elmhurst, Illinois.**

RETMA members

→ *from Page 76*

Washington and Chicago chosen for 1958 meetings

During discussions at several division meetings, and by the directors, the board voted to hold the 1958 RETMA convention at the Sheraton hotel, Chicago, site of the 1957 convention, May 14-16, 1958, just prior to the Electronic Parts Distributors Show, as was done this year. Arrangements for the 1958 Spring meeting, scheduled for March 19-21 at the Statler hotel, Washington, D. C., also were approved.

Supplier personals

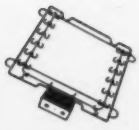
→ *from Page 90*

Three new officers have been elected by the DeVilbiss Company board of directors, according to an announcement by Howard P. DeVilbiss, president of the Toledo firm, manufacturers of spray finishing equipment, air compressors, and complete exhaust systems. *John M. Robinson* has moved up to executive vice president; *John M. Ehni* has been elected vice president, foreign sales; and *Edward J. Etzel* was promoted to vice president, purchasing.

H. E. Folkerth, president of Continental Tooling Service, Inc., Dayton, Ohio, has announced that *Herbert C. Stroh*, formerly manager of the Engineering Service division, has been appointed vice president and director of sales and advertising.

The appointment of *John Cattanach, Jr.*, as manager of sales of tubular products and cold finished steel bars at the Buffalo plant of Joseph T. Ryerson & Son, Inc., steel distributor, was announced by Paul L. Wright, general manager.

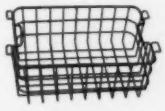
YOUR APPLIANCE NEEDS WIRE!


OVEN HEATING ELEMENT FRAME

OVEN RACK

OVEN RACK SIDE FRAME

REFRIGERATOR FREEZER BASKET


FREEZER BASKET

SWING-OUT REFRIGERATOR BASKET

Saving *your* dollars with wire is a 50-year old habit at Union Steel. Devising ingenious ways to shorten time between idea conception and delivery, creation of new designs in welded wire, engineering new methods for more rapid, economical manufacture . . . all are routine benefits you realize when you specify Union Steel, the experienced source that *guarantees* higher quality.

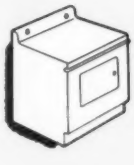
Remember, too—your appliance *needs* wire. Modern wire is the preferred material because of its styling versatility, strength, lasting beauty. Wire is basically essential to the appeal—the sale and the continuous satisfaction of your appliance.

Our experienced design engineers and production specialists are ready to help you *save with wire*. If your problem is immediate, why not 'phone Union Steel today? Or, if you would prefer additional information concerning any of USP's varied wire fabricating facilities, please fill in and mail the attached coupon.

EVAPORATOR SHELVES AND CONDENSERS

REFRIGERATOR SHELVING

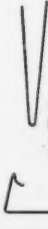
REFRIGERATOR ICE TRAY COMPARTMENT RACK



DISHWASHER BASKETS AND SECTIONS

DISHWASHER GLASS RACK

BULB GUARD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Wire Products Division ALBION, MICH.

USP

PLEASE MAIL NOW!

GENTLEMEN: Please give us, without obligation, your suggestions for the use of fabricated and finished wire in our appliances.

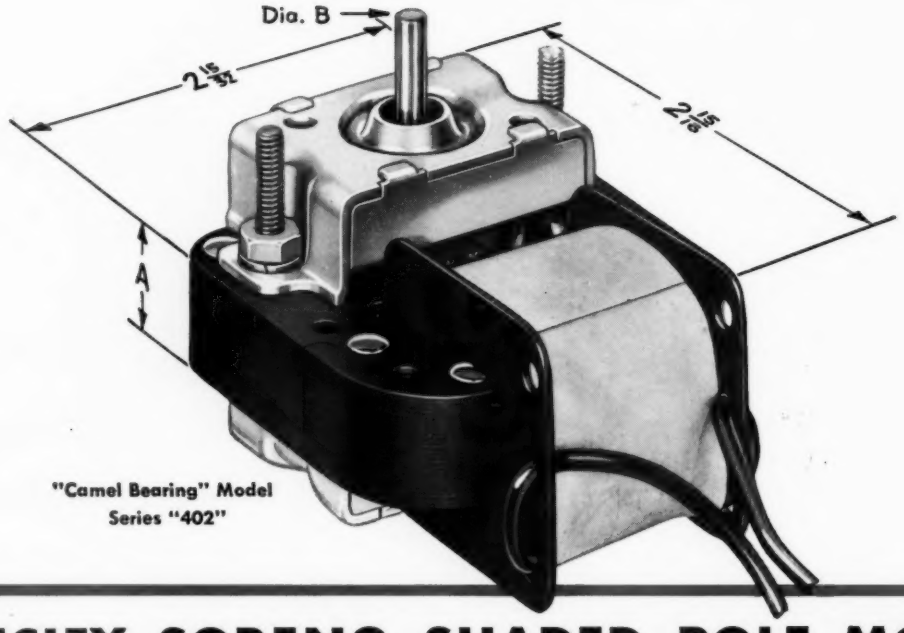
Name _____ *Title* _____

Company _____

Address _____

City _____ *Zone* _____ *State* _____

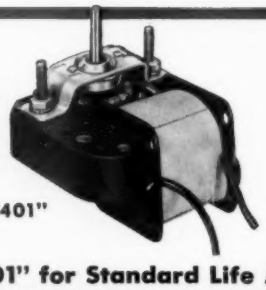
☐ Please have a USP representative contact us at once. We are interested in _____



"Camel Bearing" Model
Series "402"

SPECIFY SORENG SHADED-POLE MOTORS

Where Economical, TROUBLE-FREE Operation is a Must



Series "401"

Series "401" for Standard Life Applications

Here's a tough, durable Shaded-Pole Motor. The "401" has positive aligned bearings with self-aligning features and an open-skeleton frame for effective heat dissipation. You have your choice of 12 models. You'll find a "401" Shaded-Pole Motor that meets your needs exactly.

Series "402" with New CAMEL BEARING Holds Lubricant Thousands of Hours Longer

The "402" Shaded-Pole Motor is built to last. It's a rugged little powerhouse with an EXTRA long life due to its exclusive, new CAMEL BEARING design. This special bearing bracket provides automatic, positive oil circulation even under high temperatures. Oil is constantly feeding into bearing cavities as operating conditions demand.

The "402" is made of high quality, silicon steel. It's versatile, too! The rotor bracket is easily removed so that the motor can be adapted to a variety of field applications. Standard mounting holes make it interchangeable with other motors. Range of 12 models cover all types of applications.

MODEL NO'S (3)	402-10 402-11 401-10 401-11	402-20 402-21 401-20 401-21	402-30 402-31 401-30 401-31	402-40 402-41 401-40 401-41	402-50 402-51 401-50 401-51	402-60 402-61 401-60 401-61
VOLTS	115	115	115	115	115	115
FREQUENCY	60	60	60	60	60	60
AMPERE—NO LOAD	0.31	0.42	0.55	0.64	0.97	1.31
WATTS—NO LOAD	13.5	19	24	27.7	40	53
R P M—NO LOAD	3400	3480	3500	3570	3560	3550
MAX. HP. OUTPUT(1)	1/500	1/200	1/125	1/75	1/50	1/40
START TORQUE OZ. IN	0.58	1.4	2.3	2.3	3.3	4.9
STALLED WATTS	18	29	40	45	68	98
STACK WIDTH "A"	3/8"	3/4"	3/4"	3/4"	1-1/4"	1-1/2"
SHAFT DIA. "B"	0.182	0.182	0.182	0.182	0.2178	0.2178
WEIGHT—POUNDS	0.8	1.2	1.4	1.6	1.9	2.4

SORENG SHADED-POLE MOTORS HAVE OVER 140 PRODUCT APPLICATIONS

Typical Applications include: springwire, gear, chain, rubber belt and friction drives or, to move high velocity, heater or sirrocco air.

NOTES:

1. HP RATING AT 3000 RPM—CONTINUOUS DUTY FAN LOAD
2. ALL NUMBERS ENDING IN "0" DENOTE CLOCKWISE SHAFT ROTATION
   ALL NUMBERS ENDING IN "1" DENOTE COUNTER-CLOCKWISE SHAFT ROTATION
3. 402—LONG LIFE SERIES
4. 401—STANDARD LIFE SERIES
5. LEADS—#20AWGX 7" LONG LEAD WIRE THERMO PLASTIC

Send for your copy of Soreng's new booklet on Shaded-Pole Motors. It contains drawings, technical data and specific applications.

CONTROLS COMPANY OF AMERICA
Manufacturers of *SORENG* controls
9559 SORENG AVENUE • SCHILLER PARK, ILLINOIS

controls that make modern living possible